Department of
Agriculture

Forest Service

Forest Pest
Management

Davis, CA

NOTES

National Pesticide Coordinator's Meeting, Salt Lake City, Utah September 29 - October 2, 1992

FPM 93-3
October 1992

Pesticides used improperly can be injurious to human beings, animals, and plants. Follow the directions and heed all precautions on labels. Store pesticides in original containers under lock and key—out of the reach of children and animals—and away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides where there is danger of drift when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment, if specified on the label.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

NOTE: Some States have restrictions on the use of certain pesticides. Check your State and local regulations. Also, because registrations of pesticides are under constant review by the U.S Environmental Protection Agency, consult your local forest pathologist, county agriculture agent, or State extension specialist to be sure the intended use is still registered.

FPM 93-3
OCTOBER 1992

NOTES

National Pesticide Coordinator's Meeting, Salt Lake City, Utah September 29 - October 2, 1992

Prepared by:

Jack Barry

Pat Skyler

USDA Forest Service
Forest Pest Management
2121C Second Street
Davis, CA 95616

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INTRODUCTION

INTRODUCTION

The intent of these notes is to document the 1992 National Pesticide Coordinators' meeting that was held in Salt Lake City, Utah, September 29 to October 2, 1992. The notes will serve as a reference in follow-up actions to the meeting, as a resource reference for pesticide coordinators, and as background information for planning future meetings.

The meeting had two objectives: to provide a forum for the exchange of pesticide-use related information between and for related Washington Office staff and field units to encourage interactions among pesticide coordinators, and to identify needs and issues that need attention and actions; and to conduct a strategic planning session that would provide input from the field, provide pesticide coordinators the opportunity to participate in the national planning process that would help develop a Strategic Plan for the Washington Office, Forest Pest Management - Pesticide Use, Management and Coordination (PUM&C) Staff.

Recognizing the limitations of having only three days to address both objectives, the consensus was that both objectives were satisfactorily satisfied after the three-day meeting. Follow-up actions of enhancing information flow and communication, and finalizing the PUM&C Strategic Plan will be the final judge as to the level of success achieved by this meeting. Information generated during the strategic planning process will be the subject of a separate report.

The Washington Office, PUM&C staff found the meeting most beneficial and the staff is optimistic that follow-up activities will meet needs and expectations of pesticide coordinators and cooperators. PUM&C urges its clientele to communicate freely in open candid discussions.

WO/PUM&C Staff expresses its appreciation to all who contributed to the planning and conduct of this meeting - the planning committee, moderators, group chairs and speakers. A special note of thanks to the Intermountain Region who hosted the meeting especially Garth Baxter, Leon LaMadeleine, Steve Munson and Nancy Wright.

LIST OF ATTENDEES

List of Attendees
Pesticide Coordinator's Meeting
September 29 - October 2, 1992
Salt Lake City, Utah

NAME	ORGANIZATION/ADDRESS	PHONE NUMBER
Jack Barry	WO/FPM, 2121C 2nd St., Davis, CA 95616	(916)551-1715
John Borrecco	R5/S&PF, 630 Sansome St., San Francisco, CA 94111	(415)705-2873
Dave Thomas	R5/Eldorado NF, 100 Forni Road, Placerville, CA 95667	(916)622-5061
Pat Skyler	WO/FPM, 2121C 2nd St., Davis, CA 95616	(916)551-1715
John Weeks	Labat-Anderson, Inc., 575 Oak Ridge Turnpike, Ste. 208, Oak Ridge, TN 37830	(615)481-0171
Harold Thistle	MTDC, Ft. Missoula - Bldg. 1, Missoula, MT 59801	(406)329-3981
Ed Holsten	R10/S&PF/FPM, 201 E. 9th Ave., Ste. 201, Anchorage, Alaska 99501	(907)271-2575
Patrick Shea	PSW, 2121C 2nd St., Davis, CA 95616	(916)758-4600
Jim Space	WO/FPM, P.O. Box 96090, Washington, D.C. 20090-6090	(202)205-1600
R.D. Averill	R2/RR-FHM, 11177 W. 8th Avenue, Lakewood, CO 80225	(303)236-3213
Dan Baird	Salmon NF, P.O. Box 729, Salmon, ID 83467	(208)756-2215
Dayle Bennett	R3/S&PF/FPM, 517 Gold Avenue, S.W., Albuquerque, NM 84102	(505)842-3190
Doug Parker	WO/FPM	(202)205-1611
John Neisess	R5/S&PF, 630 Sansome Street, San Francisco, CA 94111	(415)705-2567
Christine Boivin	Labat-Anderson, Inc., 2200 Clarendon Blvd, Ste. 900, Arlington, VA 22201	(703)525-9400
Velma Charles-Shannon	WO/FPM	(202)205-1600
Zdenka Horakova	WO/FPM	(202)205-1600

NAME	ORGANIZATION/ADDRESS	PHONE NUMBER
Ralph Williams	R4/FPM, Boise Field Office, 1750 Front, Boise, ID	(208)364-4227
Edward Monnig	R1/TCFPM, P.O. Box 7669, Missoula, MT 59807	(406)329-3134
Thiel Kunz	USDA Forest Service, Supervisors Office, 2509, 5th Avenue, Pocatello, ID 83201	(208)236-7500
Charles Hatch	Northeastern Area/S&PF, 5 Radnor Corp. Center, 100 Matsonford Rd., Radnor, PA 19087	(215)975-4120
Dan Netzer	Forestry Sciences Lab, P.O. Box 898, Rhinelander, WI 54501	(715)362-7474
Russell McKinney	Forest Health Protection-USFS 310 W. Wisconsin Ave., Milwaukee, WI 53203	(414)297-3257
Normand R. Dubois	USDA-FS, Northeast Forest Exp. Station, 51 Mill Pond Rd., Hamden, CT 06514	(203)773-2026
Leon LaMadeleine	USDA-FS, 4746 S. 1900 East, Ogden, UT 84403	(801)476-9728
Karen Clancy	Forest Service Research - Rocky Mountain Station, 700 S. Knoles Dr., Flagstaff, AZ 86001	(602)556-7315
Fay Shon	Forest Service-FPM, P.O. Box 3623, Portland, OR 97208	(503)326-2728
Jesus Cota	WO/FPM	(202)205-1600
John Taylor	FPM - Room 925N, 1720 Peachtree Rd., NW, Atlanta, GA 30367	(404)347-2961
Walt Thies	PNW Station, 3200 Jefferson Way, Corvallis, OR 97331	(503)750-7408
Dennis Weber	Forest Service/R6/Timber, P.O. Box 3623, Portland, OR 97208	(503)326-7171
Paul Mistretta	Forest Pest Management - Rm 925N, 1720 Peachtree Rd., N.W., Atlanta, GA 30367	(404)347-2961

NAME	ORGANIZATION/ADDRESS	PHONE NUMBER
James D. Brown	Forest Pest Management - Rm 925N, 1720 Peachtree Rd., N.W., Atlanta, GA 30367	(404)347-2961
Charles McMahon	US Forest Service, Devall Dr., Auburn University, AL 36849	(205)826-8700
A. Temple Bowen Jr.	Novo Nordisk Bioindustrials, Inc., 33 Turner Rd., Danbury, CT 06813-1907	(203)790-2632 FAX 790-2611
Craig Ramey	USDA/APHIS/ADC, Denver Wildlife Res. Center, Bldg. 16, Denver Federal Center, Denver, CO 80225	(303)236-7896
Norman Rees	USDA, ARS, RWL, 402 Culbertson Hall, MSU, Bozeman, MT 59717-0056	(406)994-6405
Michael Smith	Science Applications Int'l Corp. (M/S 1-4-2), 1710 Goodridge Dr., McLean, VA 22021	(703)827-4772
Garth Baxter	Forest Service, S&PF, 324 25th St., Ogden, UT	(801)625-5258
John C. Nord	Forestry Sciences Lab, 320 Green St., Athens, GA 30602	(706)546-2467

WASHINGTON OFFICE MEETING CALL LETTER

United States Department of Agriculture | Forest Service | Washington Office | 14th & Independence SW
P.O. Box 96090
Washington, DC 20090-6090
(202) 205-1600

Reply To: 2150 Date: September 2, 1992

Subject: National Meeting of Pesticide Coordinators

To: Moderators, Work Group Chairs, Planning Committee, and Speakers

The National Pesticide Coordinators meeting will be held September 29-30 and October 1-2, 1992, in Salt Lake City, Utah, hosted by the Intermountain Region. Meeting theme is "Meeting Challenges of the 1990's." This meeting had been announced previously by a Washington Office letter to Regional Foresters, Station Directors, and Area Director.

Enclosed with this memorandum you will find:

1. Meeting Agenda.
2. Work Group Information.
3. Pesticide Coordinators Report Information.
4. Guidelines for Moderators.
5. List of Moderators, Work Group Chairs, and Planning Committee.
6. Copy of a basic strategic plan.

A few items, as follows, need further coordination:

1. Moderators please notify and confirm speakers listed on the enclosed agenda and let me know of any changes.

2. Moderators should also review the enclosed Guidelines for Moderators and provide an objective statement for their respective session.

3. Pesticide Coordinators should circulate the enclosed meeting notice and hotel information.

4. Pesticide Coordinators should prepare a summary report as described in the enclosed Pesticide Coordinator's Report Information.

The meeting will be held at the Salt Lake City (Downtown) Hilton, 150 West 500 South, Salt Lake City, Utah, 84101. We have reserved a block of guest rooms; the room rate is $54 (single) or $64 (double) plus tax. Please contact the Salt Lake Hilton directly at (801) 532-3344 to make your room reservations as soon as possible, informing the reservation clerk that you are with the "Forest Service - Pesticide Coordinator's Meeting." Please try to stay at the Hilton

as our meeting room rental fees will be waived if we book sufficient guest rooms. Ground transportation from the Salt Lake City Airport is provided by the Salt Lake City (Downtown) Hilton. Upon arrival at the airport, use the hotel courtesy phone to call the Hilton for pick-up. Shuttles run approximately every 20 minutes.

We look forward to your participation.

/s/ James C. Space
JAMES C. SPACE
Director of Forest
Pest Management

Enclosures (6)

cc:
List (Enclosure 5)

FPM:J.Barry/J.Cota:lt:09/02/92

Enclosure # 1

REVISED 9/28/92

AGENDA
NATIONAL PESTICIDE COORDINATOR'S MEETING
SALT LAKE CITY, UTAH - DOWNTOWN HILTON
SEPTEMBER 29-30 AND OCTOBER 1, 1992

TUESDAY - SEPTEMBER 29

Time	Topic	Moderator	Speaker
	OPENING PROGRAM	Jack Barry	
0800-0815	. Welcome		Laura Ferguson
0815-0845	. Opening Remarks		Jim Space
0845-0900	. Meeting Objectives, Relevancy & Expectations		Jesus Cota
0900-0915	. Meeting Procedures and Facilitation		Facilitator
0915-0930	. Pesticide Use Management & Coordination - Mission Overview		Jesus Cota
0930-1030	. FS Vision/Policy & Focus for Trng. & Deve. of Work Force		Grant Mortensen
1030-1045	BREAK		
1045-1145	. Pesticide Role in Ecosystem Management	Ed Monnig	
	STRATEGIC PLANNING	Facilitator	
1145-1200	. PUM&C Proposed Strategic Plan & Vision		Facilitator
1200-1300	LUNCH		
1300-1400	. Work Group Meetings Vision Statement	Facilitator	Work Group Chairs
1400-1500	. Work Group Report Out Vision Statement		Work Group Chairs

Time	Topic	Moderator	Speaker
1500-1515	BREAK		
	LAWS & REGULATIONS	Ed Monig	
1515-1545	. Wetlands & Groundwater		John Taylor
1545-1600	. Risk Assessment		Zdenka Horakova
1600-1615	. Risk Assessment		Velma Charles-Shannon
1615-1715	. Forest Service Risk Assessments		Chris Bolvin

WEDNESDAY - SEPTEMBER 30

Time	Topic	Moderator	Speaker
0730-0800	. Vegetation Mgt. Risk Assessment	Ed Monig	Garth Baxter
0800-0830	. Other Laws that will impact us in the 1990's		Ed Monig
	STRATEGIC PLANNING	Facilitator	
0830-1000	. Work Group Meetings Environmental Scan Current & Future Needs	Facilitator	Work Group Chairs
1000-1015	BREAK		
1015-1130	. Work Group Report Out	Facilitator	Work Group Chairs
1130-1300	LUNCH		
	TECHNOLOGY DEVELOPMENT	John Borrecco	
1300-1315	. NAPIAP Overview		Zdenka Horakova
1315-1345	. Technology Development Projects National Steering Committees		Jesus Cota Jack Barry
1345-1430	. Biological Control of Weeds		Norm Rees
1430-1500	. Pesticide Residue Monitoring		Charles McMahon
1500-1515	BREAK		

Time	Topic	Moderator	Speaker
	PESTICIDE USES & APPLICATION	Garth Baxter	
1515-1545	. Biopesticides		Norm Dubois
1545-1615	. Pheromones & Other Biorational Materials		Pat Shea
1615-1645	. Herbicides - Overview		Garth Baxter
1645-1715	. Weed Management		Steve Dewey

THURSDAY - OCTOBER 1

Time	Topic	Moderator	Speaker
	STRATEGIC PLANNING	Facilitator	
0800-0900	. Work Group Meetings Program Goals		Work Group Chairs
0900-0945	. Work Group Report Out Program Goals		
0945-1000	BREAK		
1000-1100	. Work Group Meetings Identifying Objectives		Work Group Chairs
1100-1145	. Work Group Report Out Identifying Objectives		
1145-1300	LUNCH		
1300-1330	. Silvicultural Treatments	Garth Baxter	Max Williamson
1330-1400	. Vertebrate Pest Management & Manual		John Borrecco
	INFORMATION EXCHANGE	Curtis O'Neal	
1400-1415	. Forest Service Handbook		Doug Parker
1415-1430	. Pesticide Background Documents		Velma Charles-Shannon

Time	Topic	Moderator	Speaker
1430-1500	. Information Needs of Pesticide Coordinators Discussion: Timely Tips Advisory Memorandums NPIRS Others	Curtis O'Neal	Paul Mistretta
1500-1515	BREAK		
1515-1615	. Risk Communication		Charles McMahon
1615-1700	. Meeting Summary & Critique		Facilitator Jesus Cota

FRIDAY - OCTOBER 2

Time	Topic	Moderator	Speaker
0830-1130	Field Trip to Gypsy Moth Treatment Sites (optional)	John Anhold	

WORK GROUP INFORMATION

1. The purpose of Work Groups is to obtain participatory input from pesticide coordinators for the strategic planning process and issues identified by the coordinators as well as those identified by the PUM&C staff. The Work Group process will also help to promote participation and contributions, develop ownership, and serve to keep the meeting pace interesting and moving.

2. Five Work Group (orange, red, green, blue, and purple) composed of approximately 10-15 attendees, will be established to function during the three-day meeting. Individual assignments to the committees will be based upon diversity of geographics, experience and training. Each Work Group will meet independently and present findings and recommendations to the general session.

3. Each Work Group will be pre-assigned a Chair who will be the group timekeeper. The Chair will also be responsible for submitting Work Group findings and recommendations in writing for inclusion into the proceedings and will assist the group in managing itself. Each group will appoint a reporter and select a member who will present the group's findings during the report out session.

4. The Work Group will provide input in a stepwise manner to aid in the process of development of a strategic plan for the PUM&C program. Other issues maybe assigned.

5. A facilitator will coordinate and moderate the Work Group activities.

Enclosure 3

PESTICIDE COORDINATOR'S REPORTS

Suggested Format for Regional, NA, and Station Reports to be Presented at the 1992 Pesticide Coordinator's Meeting

1. Purpose of Report: . To share pesticide related activities and information with pesticide coordinators from other Regions, NA, and Stations.

2. Scope of Report: . Actions, projects, challenges, and needs related to pesticide activities.

3. Time Period: . February 1990 - September 1992.

4. Items: . Overview of Regional, NA, and Station program implementation of new technology and approaches.

    . Technology Development Projects related to pesticides.

    . Control and eradication projects.

    . Partnerships with Research and/or cooperators.

    . Issues, needs, problems, challenges, and opportunities.

5. Needs: . What do Regions and NA need from WO/FPM to do their job during the 1990's?

6. Presentations: . Reports will be presented to the Pesticide Coordinator's assigned work group with summary of issues, needs, etc., presented by Chairperson of each work group to the general session.

Note: Please provide this report in 2-4 pages for the proceedings and give a 10-15 minute oral presentation to your assigned work group. Thanks for your cooperation and support of the Pesticide Coordinator's Meeting.

GUIDELINES FOR MODERATORS
NATIONAL PESTICIDE COORDINATOR'S MEETING

Thanks for volunteering to moderate a topic at the National Pesticide Coordinator's meeting to be held at Salt Lake City, Utah, September 29-30 and October 1, 1992. You will play a critical role in ensuring that the meeting objectives are met. Your guidelines include:

1. Developing an objective statement for your Topic Session.

2. Identifying and notifying speakers.

3. Briefing speakers on the meeting and advising speakers of your expectations.

4. Coordinating with Program Chairperson travel support for speakers. (Hopefully reimbursements will be kept at a minimum.)

5. Completing your session on time, allowing scheduled time for speakers and questions.

6. Submitting a Topic Session summary for the proceedings. The summary should include any needs, issues, challenges, and recommendations.

LIST

Moderators, Work Group Chairs, and Planning Committee

Moderators

Jack Barry
John Borrecco
Ed Monnig
Curtis O'Neil
Doug Parker
Garth Baxter
John Anhold

Work Group Chairs

Ed Holsten	- Green
John Neisess	- Orange
Doug Parker	- Blue
Fay Shon	- Red
Leon LaMadeleine	- Purple

Speakers

Laura Ferguson
Jim Space
Jesus Cota
Errol Caldwell
Ruben Gutierrez
Grant Mortensen
Zdenka Horakova
Norm Rees
Norm Dubois
Pat Shea
Garth Baxter
Doug Parker
Velma Charles-Shannon
Paul Mistretta
John Taylor
Phillip Sczerzenie
Ed Monnig
Charles McMahon
Steve Dewey
John Borrecco
Willa Garner

Planning Committee

Garth Baxter
Dayle Bennett
John Borrecco
Charlie Hatch
Doug Parker
Paul Mistretta
Jack Barry (Chair)

Enclosure 6

Draft
7-21-92

STRATEGIC PLAN

OUTLINE

PUM&C

USDA Forest Service
State and Private Forestry
Washington Office
Forest Pest Management
Pesticide Use Management & Coordination

VISION

The vision of the Pesticide Use Management and Coordination Staff (PUM&C), Washington Office, Forest Pest Management, is to be recognized as the focal point of world leadership for information and technology on scientifically sound use of pesticides in forestry.

PURPOSE

The purpose of PUM&C staff is to provide national and international leadership in the safe, economic, efficacious, and environmentally sound use of pesticides to support the health of trees, forests, and the ecosystems.

NATIONAL AND WORLD ISSUES AND TRENDS

There are several national and world issues and trends that will have a profound influence on the future program of PUM&C. The declaration by the President and other world leaders to support healthy forests and protect the environment are the primary issues that will accelerate PUM&C's participation in world forestry. Forests in this context includes all stands of trees from wild stands, to plantations, to urban forests. PUM&C's purpose of existence has now expanded globally. Current and future issues will be dealt with in this context with challenging opportunities to establish and maintain global leadership. There are several issues and other trends that are directly and indirectly related to use of pesticides in establishing and/or maintaining healthy forests. The trend from traditional chemical pesticides to other more environmentally acceptable materials is leading, on an interim basis, to the use of biopesticides. The future will provide more advanced biorational materials and techniques for forest pest prevention and control providing that PUM&C exercises leadership coordinating development of such activities. PUM&C will be approaching its role from the current product/pest approach to an ecosystem approach consistent with forest health and new perspectives in forestry. This will present major opportunities as PUM&C provides leadership in coordinating research and administering the development and registration of advanced biopesticides and biorational materials for use in ecosystem management into the future decades.

PROGRAM UNITS

Providing global leadership in pesticide use technology transfer, and developing a network system for collecting and disseminating pesticide and related information to and from clients.

Identifying the future need and role for pesticides in total ecosystem management, reforestation, forest health and habitat restoration consistent with diversity and new perspectives.

Providing leadership in developing technologies for the safe, economic, efficacious application of pesticides, and pheromones.

Defining PUM&C's role in managing herbicides and providing a leadership role in coordinating herbicide use activities with National Forest System staffs, State and private owners, and international clients.

Strengthening relationships with U.S. Environmental Protection Agency and U.S. Fish and Wildlife Service in use of pesticides in environmentally sensitive habitats and reduction of potential impact on threatened and endangered species and other non-target species.

Developing a national and international training program for use of pesticides in forestry.

Providing leadership in coordinating research, evaluating and registering biopesticides, and biorational agents and systems.

Expanding PUM&C's role in support of pest prevention and protection in agro-forestry and shelter belts.

Establishing PUM&C's role and relationship with Cooperative Forestry in use of pesticides for pest prevention and protection of urban forests.

Expanding the PUM&C program for addressing pesticide data gaps related to risk assessment, other environmental documentation, and environmental fate of pesticides in the forest ecosystem, and impact on non-target organisms.

Providing national and international leadership in coordinating private and public pesticide-use research needs.

(Format for each of the above Program Units to be completed by appropriate PUM&C staff officer)

Objective

Background

Assumptions

Facts Bearing on the Program Unit

Discussion and Scope of Program Unit

Desired State

Actions and Time Schedule

Responsible Staff Officer

LIST OF WORK GROUPS

Five work groups were set up to work as teams during the meeting. These teams will continue on an informal basis in providing input and review during development of the strategic plan.

Black Group

Work Group Chair - Ed Holsten, R-10

Participants - Dayle Bennett, R-3
Garth Baxter,R-4
Paul Mistretta, R-8
Dave Thomas, R-5
Jack Nord, SE
Harold Thistle, MTDC
Ralph Williams, Boise Field Rep.

Yellow Group

Work Group Chair - John Neisess, R-5

Participants - John Borrecco, R-5
Jesus Cota, WO
Thiel Kunz, R-4/Caribou NF
James Brown, R-8
Charles McMahon, SO

Blue Group

Work Group Chair - Doug Parker, WO

Participants - Dan Netzer, NC
Dan Baird, R-4/Salmon NF
John Taylor, R-8
Bob Averill, R-2

Orange Group

Work Group Chair - Ed Monnig, R-1

Participants - Fay Shon, R-6
Zdenka Horakova, WO
Pat Skyler, WO/Davis
Dennis Weber, R-6
Charles Hatch, NA

Green Group

Work Group Chair - Leon LaMadeleine, R-4

Participants - Pat Shea, PSW
Norm Dubois - NEFES
Karen Clancy - RM
Velma Charles-Shannon, WO
Russell McKinney, NA-FHP
Walt Thies, PNW

LIST OF FPM NATIONAL STEERING COMMITTEES

October 1, 1992

NATIONAL FPM TECHNOLOGY DEVELOPMENT STEERING COMMITTEES AND CHAIRS

National Spray Model Advisory Committee - Jack Barry

National Steering Committee - Gypsy Moth and Eastern Defoliators - Jack Barry

National Steering Committee - Western Defoliators - Jack Barry

Bark Beetles - Dave Holland

National Steering Committee - Seed, Cone, and Regeneration Insects - Jack Barry

Eastern Diseases - Dan Brown

Western Diseases - Dave Johnson

Modeling, Integrated Systems, and Remote Sensing - Bov Eav

National Steering Committee for Managing Vegetation on Forest and Range Lands - Doug L. Parker

REGIONAL, AREA AND STATION REPORTS

REGION 1

NORTHERN REGION REPORT

Pesticide-related activities in the Northern Region combine both the traditional and the innovative in a wide-ranging program. Major areas of emphasis include the following.

Training and Technical Assistance

The Regional Pesticide Specialist typically conducts up to six pesticide training courses throughout the Region each year. In addition he assists the States of Montana and, to a lesser extent, Idaho in state recertification courses.

The Region has found that training in safe and effective use of pesticides is most effective if offered directly to the user at the District. "Trickle-down" training that relied on trained Forest level personnel is often ineffective because for most Forest personnel pesticide responsibilities are one of those "other duties as assigned." Few Forest personnel have the time to maintain expertise.

Pesticide training has been quite well received as evidenced by the number of return requests for Regional Pesticide Specialist involvement in State training.

Technical assistance is also another important role for the Regional Pesticide Specialist. Technical assistance is necessary particularly during the initial phases of programs involving pesticide use on individual Forest and Districts. Over the past several years pesticides have become increasingly important tools in the noxious weed control program and in the development of early selection trials and seed orchards. The number of Forests with active noxious weed programs has increased steadily, and all Forests in the Region are now involved. The Region has also developed 8 sites for use in progeny testing and seed orchards. These facilities require routine applications of pesticides including rodenticides, fungicides, herbicides, and insecticides. Since the field level personnel often have little experience in pesticide application, Regional assistance is often required.

A major part of the technical assistance program is developing and adapting application methods that will allow safe and effective use of pesticides. The emphasis is primarily on ground methods that have the greatest possibility of worker exposure.

The Region also completed its first aerial application of herbicides in over 10 years. This application was part of a cooperative project involving local ranchers in the control of noxious weeds.

Regulatory Assistance

The Regional Pesticide Specialist has continued to provide expertise and assistance on the regulatory and policy aspects of pesticide use in the Region. NEPA compliance continues to be a major challenge. Eleven of the thirteen Forests in the Region have completed Environmental Impact Statements for noxious weed control. Human health and ecological risk assessments for these documents has generally been provided by the Regional Pesticide Coordinator. Traditionally the Region has provided its own human health risk assessments for the NEPA process without the use of contractors.

Recently, the Northern Region did combine resources with other western Regions to develop a human health risk assessment for vegetation management. LAI completed this document in the last month, and it is being printed.

In the past several years the Region has also developed NEPA documents (generally EA's) for the development of progeny testing and seed orchard sites. These documents considered the impacts of pesticide use.

Research and Technology Development

The Region has been closely involved in several research projects funded through the NAPIAP program. These projects have investigated the environmental fate of pesticides in soil, vegetation, and ground and surface water, a comparison of the effects of pesticide use and noxious weeds on plant species diversity, and the control of exotic species with NAPIAP. This work is being conducted on a cooperative basis with the Intermountain Station and the University of Montana

The Region also continues its work in the use of pheromones such as MCH and verbenone for control of bark beetles. The aerial application of these compounds is being investigated. In addition the baiting of individual trees with Douglas-fir beetle pheromone as part of bait-and-cut projects is being routinely performed in the Region.

Biodiversity, Forest Health, and Ecosystem Management

The Region has begun a more aggressive program to protect Wilderness Areas from invasion by exotic species that pose a significant threat to natural processes. An EIS has been prepared and implemented without appeal for a program that has targeted exotic plant species for eradication on sites in and on the edge of the Bob Marshall Wilderness complex. This effort has required significant interaction with the public as understanding of this threat has increased.

The Region has applied for 1994 funding under the Forest Health initiative for ecosystem restoration work in the ponderosa and white pine forest types. Much of the work anticipated in these programs could require site preparation with herbicides. Mechanical scarification could be cost prohibitive particularly on the steeper slopes in the white pine type. This work will require close coordination with District and Forest silviculturists, who, in many cases, are unaware of the possible applications of chemical control.

Washington Office Interactions

The Washington Office/FPM can provide valuable assistance to the field by coordinating efforts to address issues of joint concern with the Regions. By doing so we can avoid duplication of efforts. Areas that require increased common effort include human health risk assessment, research efforts into worker exposure and safety, and the development of low impact application methods, semiochemicals, and other biorational materials for pest control.

The Washington Office should also resume a more prominent role in providing information and assistance to field units.

REGION 2

SUMMARY OF PESTICIDE PROGRAM IN REGION TWO 1990 - 1992

NOXIOUS WEED PROGRAM

Noxious weeds are spreading throughout the Region at a rate of 5-10% per year. Reduction or prevention of of the spread of noxious weeds could save millions in funds for the next 10 years. The primary objective of the noxious weed management program is to prevent the the reproduction and spread of noxious weeds on National Forest System Lands and the movement from these lands to adjacent private lands.

An ongoing noxious weed program will be funded by the benefitting or combination of functions where resource management activities provide conditions condusive to noxious weed introduction or encroachment. Forest Supervisors will use the nonstructural Range Improvement handbook Chap. 300 to develope and implement there weed programs.

Our Multi-Regional "Risk Assessment for Herbicide Use in Forest Service Regions 1,2,3,4 and 10 and Bonneville Power Administration Sites" have finally been completed. The assessment will help help various Regions in preparing NEPA documents. In Region Two the need for the document was so urgent that some Forests made use of it in draft to help write the EA for their noxious weed programs.

GROUNDWATER ISSUE

The Wyoming Department of Agriculture established the Groundwater and Pesticide Strategy Committee (GPSC) in April 1990. The committee is currently preparing a generic State Pesticide Management Plan (SMP) to be voluntarily submitted to EPA. The SMP will contain twelve program components to attain the ultimate objective of preventing groundwater contamination that may present adverse affects to human health and the environment. The twelve components included ina generic SMP are:

1. states philosophy and goals towards protecting groundwater
2. roles and responsibilities of state agencies
3. legal authority
4. resources
5. basis for assessment and planning
6. monitoring
7. preventive actions

8. response to detections of pesticides

9. enforcement mechanisms

10. public awareness and participation

11. information dissemination

12. records and reporting

While all twelve of the components need to be discussed in the a generic SMP, the extent to which each is addressed will depend on Wyomings unique hydrogeologic and institutional charateristics, including its groundwater protection philosophy, groundwater sensitivity, degree of pesticide use, agronomic practices and value of groundwater.

The Forest Service Regional Pesticide Coordinator is keeping current with GPSC and Advisory member activities in order to evaluate how the States groundwater program could affect the FS pesticide application program in the State of Wyoming.

FEDERAL CERTIFICATION PROGRAM

The Forest Service Pesticide Coordinator and Beaureu Of Land management Coordinators saw an oppurtunity to strengthen our noxious weed program by joining the BLM regional Pesticide Certification Program. The Federal program is EPA approved and was redesigned in 1991 to incorporate an Integrated Pest Management approach.

Region Two Pesticide Coordinator solicited input from Pesticide Coordinator in the Region and got positive responses to the program. As a result, in 1992 fourteen Forest Service employees attended the certification training. Nine of the 14 participants are now certified under the Federal program. The BLM is currently evaluating the program to determine whether to expand it and/or turn it over to there Phoenix-based training center.

The program was critiqued by Forest Service attendees to help Coordinators determine what can be done to improve the overall program and to help see what alterations could be made to better serve the Forest Service. The following information resulted:

GENERAL COMMENTS

Positive - Fairly thorough course - provided adequate info to plan and conduct IPM program.

- notebook and handouts were more than adequate

Negative - five days and four evenings is too much time

course needs to be divided and structured for:

a. people that have never been certified
b. people that are being recertified

- many presentations were either too lengthy or did not adequately address needs of attendees

- in some cases, course did not follow logical progression subjects.

SUGGESTIONS FOR IMPROVEMENT

1. Structure course to either train people that have never been certified and another abreviated course/update for recertification.

2. General outline of course should be changed to:

   a. More consideration for integrated pest mangement

   b. Environmental considerations for pesticide use (ie: groundwater,sensitive areas, T&A species)

   c. Pesticide applicator core session should more or less follow format and content of publication "Applying Pesticides Correctly"

   d. Provide more discusssion and handouts on best management practices for most effective pesticide use.

   e. Discussion and handouts of recently developed new products that provide best control with minimal environmental impact.

PESTICIDE USE MANAGEMENT

During 1990 - 1991 nearly 60% of the acres treated in Region Two was for treatment of noxious weeds with herbicides. All applications were ground treatments. Roughly 13,000 acres were treated with pesticides in 1990. Six thousand of of these acres were treated with herbicides. Nearly 20,000 acres were treated with pesticides in 1991 and 12,500 acres where treated with herbicides.

PESTICIDE USE IN R-2 1990/1991

Type of Pesticide	Chemical Used	Target Pest	Units Treated 2/ 1990	1991
Fumigant	Methyl bromide/ Chloropicrin	Nematodes and Fusarium in nursery beds	13	11
Fungicide	Benomyl	Phomopsis canker/Scleroderris	25	80
	Zineb	Lophodermium/Scleroderris	3	5
Herbicide	Dicamba	Noxious weed control	3	459
	Diuron/Bromacil	Rights of way/General weed	28	16
	Glyphosate	General weed control	611	217
	Picloram	Noxious weed control	950	2279
	Tebuthiuron	Range/wildlife habitat improvement	636	1084
	2, 4-D	Noxious weed/Range improvement	185	2070
	2, 4-D/Dicamba	Noxious weed/Range improvement	591	692
	2, 4-D/Picloram	Noxious weed control	2801	5609
Insecticide	Carbaryl	Mountain pine beetle	23	20
	Coumaphos	Lice, mites, ticks	15238 head cattle	15200
	Dimethoate	Tip moths	6	8
Rodenticide	Aluminum phosphide	Prairie dogs	42	24
	Zinc phosphide	Prairie dogs	6342	7195

1/ Includes use by the USDA Forest Service, other federal agencies, permittees, licensees, and grantees.
2/ Units are in acres unless otherwise indicated.

REGION 3

REGION 3 PESTICIDE COORDINATOR'S REPORT

Pesticide use in Region 3 is at a very low level. Use of herbicides have been on hold pending completion of the Vegetation Management Risk Assessment. Now that the risk assessment has been completed, we anticipate herbicide use will increase in 1993, particularly in noxious weed programs and in road maintenance along State highway rights-of-way. No aerial application of insecticides was conducted over the last 2 years and none is anticipated for FY 1993.

Pesticide uses over the last 2 years include:

- ground application of B.t. to protect foliage in campgrounds.
- antimycin applied to streams in native trout reintroduction programs.
- sodium cyanide in M-44 devices for use in predator control.
- putrescent egg solids applied to seedlings to repel elk and deer in plantations.
- glyphosate applied around tanker sites and parking lots to control weeds.

Technology Development Projects related to pesticides:

Nontarget Moth Study (Flammulated Owl Food Base)--In 1991, we initiated a multiyear study to monitor the effects of B.t. on nontarget moths (the primary food base of the flammulated owl--a state listed sensitive species) in an area on the Carson National Forest where a potential western spruce budworm suppression project was being proposed for 1992. Objectives of the study were (1) to determine species diversity and the relative abundance of moths within and adjacent to the proposed B.t. application area; (2) to monitor the effects of B.t. on nontarget moth populations during the year of application; and (3) to monitor the longterm effects of B.t. on nontarget moth populations. However, since 1991 the western spruce budworm populations have declined, the proposed suppression project was canceled, and any additional trapping in the area has been indefinitely postponed. We are still sorting, counting, and pinning the hundreds of moths that we collected in 1991 (via eight light traps operated twice weekly over a five-week period in June and July). We have sorted, counted, and pinned approximately 75 percent of the collected moths. We are "rough" sorting by gross morphological similarities, but still need to have representatives of each "group" identified to genus and species, if possible. We plan to conduct a statistical analysis to determine if any differences exist between the eight sampled locations and will summarize this information in a report.

Nontarget Sensitive Butterfly Survey--In 1991, we contracted with Dr. Wayne Whaley, Enviro West Consulting, to survey for habitat and/or colonies of a New Mexico State listed sensitive butterfly species. Colonies of this butterfly, the blue-black silverspot fritillary (Speyeria nokomis nigrocaerulea), have been reported in close proximity to a proposed 1992 western spruce budworm suppression project area. Results of Dr. Whaley's survey showed two large colonies located within two and one-half to five miles of the proposed spray areas. No colonies or individuals were found within the proposed treatment areas even though some "marginal" habitat was noted.

Issues, Needs, Problems, Challenges, and Opportunities:

Pesticide use in general, particularly use of herbicides, predacides, and the aerial application of B.t., the only insecticide we've used in several years, continues to be an issue in itself. A significant and vocal segment of the public is against the use of many of these materials. Specific issues include cost effectiveness, effects on the "balance of nature," water contamination, and effects on nontarget organisms, especially threatened, endangered, and sensitive species. Our greatest need in the 1990's will be to provide reliable data related to these specific issues.

REGION 4

PESTICIDE COORDNITOR'S REPORT
REGION 4
by Garth Baxter Regional Pesticide Specialist

OVERVIEW OF REGIONAL PROGRAMS

PESTICIDE TECHNOLOGY DEVELOPMENT

NAPIAP

A two year study was completed, with Utah State University, on "Tall Larkspur Control on High Elevation Rangelands: Assessment of Herbicide Application Techniques and Environmental Impacts". It compared the effectiveness of glyphosate, metsulfuron, and picloram on the control of this important poisonous plant on rangeland. It also compared the herbicide residues of the three products in runoff water and soil depths. A summary of the report is enclosed.

We have just started a two year study with Utah State Water Resources Laboratory on "Influences of Soil Organic Matter Type and Quantity on the Sorption Behavior of Selected Pesticides in Forest and Rangeland Soils". The products being tested include sulfometuron methyl, trichlopyr, and hexazinone.

VEGETATION MANAGEMENT.

The past two years a number of demonstration plots have been put in throughout the Region for the use of herbicides in controlling undesirable vegetation in timber site preparation and release. These studies have been expanded to include the control of brush on ski areas and for right-of-way maintenance. There is a considerable amount of competing and unwanted vegetation in the Region in timber sale areas. The herbicide tool has not been used in managing this problem. Low impact methods of vegetation management were employed in the demonstrations. The studies are now complete and the results will be prepared this winter. This work was done in conjunction with Max Williamson, Vegetation Management Specialist. Max will be making a presentation at this meeting explaining these methods.

Demonstration plots have also been put in the past two years on especially problemsome noxious weeds and range weeds which we have only been marginally successful in controling. Most of these studies involve the sulfonyl urea herbicides of chlosulfuron, sulfometuron, and metsulfuron. These studies are complete and are now in the process of being analyzed.

RISK ASSESSMENT.

The Region coordinated the preparation of the "Risk Assessment for Herbicides Used in Forest Service Regions 1, 2, 3, 4, 10 and Bonneville Power Administration Sites". This has been a major effort the past two years. This document is now complete. Training is now underway for Forest and District Pesticide Coordinators and other resource people who will be incorporating this in their site specific vegetation management projects. This Training is being provided in Region 4 and to some of the other Regions.

CONTROL AND ERADICATION PROJECTS

NATIONAL FOREST PROJECTS WITHIN THE REGION

Enclosed is sheet showing the summary of pesticide projects within the Region for 1991. The 1992 reports are not in at this date but the program is similar to 1991. You will note that the Region pesticide program is not especially large but it is quite diverse.

Enclosed also is a sheet indicating the historic and projected vegetation management programs with herbicides in Region 4. This information is compiled from material supplied by the Forests. The huge increases projected for the future program reflects the amount the Forests estimated they would do after the Risk Assessment is completed. These acres appear very ambitious and are probably not realistic to achieve but they do indicate a strong need and desire to use herbicides to manage vegetation

GYPSY MOTH ERADICATION PROJECT.

Great strides are being made toward eradication of Gypsy Moth along the Wasatch front. It is estimated that the density of the gypsy moth has been reduced by about 95% the past two years. Bacillus thuringensis (b.t.) is the product being used.

In conjunction with the Gypsy Moth eradication project, lepidoptra monitoring studies are being conducted by Wayne Whaley. Jack Barry and researchers from Dougway Proving Grounds are conducting studies on off site movement of B.t. spray, canopy penetration of B.t., and soil background studies of B.t. The past summer, Gypsy Moth flight pattern studies were also made. Details on the Gypsy Moth project eill be presented on the Gypsy Moth tour Friday.

NEEDS FROM WO/FPM

-Basic training on pesticide characteristics and mode of action
-Newsletter such as "Timely Tips" to keep us current on pesticide issues and regulations.
-Now that practically all National Forest lands are covered by risk assessments for the use of herbicides, it is important that these documents be kept current. This can best be done by the Washington Office FPM. When new data becomes available that will affect the risks of using any herbicide or a new herbicide is developed, the existing risk assessments need to be modified to reflect this risk.
-Provide short summaries to the Regions on the findings of NAPIAP projects.
-Provide leadership in Pesticide-Use, management and coordination. This includes herbicides, insecticides, pheromones, precicides, rodenticides, wood preservatives etc. Biological control and other IPM methods should also be included.
-Provide information on current ground water, human health, T&E species and other issues associated with pesticide use.

Tall Larkspur Control on High Elevation Rangelands: Assessment of Herbicide Application Techniques and Environmental Impacts

Larkspur control summary

Glyphosate was most effective on both species of larkspur at both locations. The spray application of glyphosate was more effective than the roller. But glyphosate, being nonselective, killed most of the desirable perennial species. Weedy annual forbs and rhizomatous forbs increased following spray application, at Oakley. The roller applicator was not as detrimental to cover and production of perennial forbs and grasses as the spray. However, the other selective herbicides allowed grass production to increase more than did glyphosate.

Metsulfuron was more effective on duncecap larkspur at Oakley than tall larkspur at Manti. It killed 70-81% of duncecap larkspur with the spray application at 1.1 and 2.2 kg/ha respectively. However, Ralphs et al. (1992) reported kill rates near 100% on the same site in previous years. Control of tall larkspur at Manti was very low. The cool weather and unfavorable growth conditions at the subalpine zone in the early growth stages may limit the usefulness of metsulfuron on these sites. There was no difference in application methods at Oakley, but the roller applicator gave a better kill of tall larkspur than the spray at Manti. Metsulfuron allowed grasses to increase more than the other herbicides.

Picloram was more effective on tall larkspur at Manti than on duncecap larkspur at Oakley. However, the 2.2 kg/ha spray rate killed greater than 85% of larkspur plants at both locations. There was no difference in application methods at Manti, but the roller was much less effective at Oakley. Picloram allowed grass cover and production to increase, but the higher rates limited the amount of increase in grass cover and production at Manti.

1991 PESTICIDE USE
Intermountain Region

INSECTICIDE AND PHEROMONES

Western Pine Beetle	1,150	Trees	Pheromones
Gypsy Moth	30,000	Acres	Bt
Tussock Moth	600	Acres	Pheromones
D.F.Beetle	500	Trees	Pheromones
Mormon Cricket	3,548	Acres	Carbaryl
Grasshoppers	--------		--------
Mosquito Control	18	Acres	Bt

FUNGICIDES

Nursery Root Rot	23	Acres	Fungicide

HERBICIDES

Noxious Weed Control	9,674	Acres	Herbicides
Range Management	874	Acres	Herbicides
R-O-W	60	Acres	Herbicides
Poisonous Plants	98	Acres	Herbicides
Nursery Weeds	33	Acres	Herbicides
General Weed Control	150	Acres	Herbicides

MISCELLANEOUS

Undesirable Fish Control	15,600	A/F	Rotenone
Pocket Gophers	7,582	Acres	Strychnine
Predators	--------		Sodium Cyanide

HISTORIC AND PROJECTED ANNUAL VEGETATION MANAGEMENT WITH HERBICIDES

Intermountain Region - Forest Service

	Past 5 Years Average	Future/Annual Projected
Site Prep and TSI	46	3,800
Range	730	14,754
Wildlife and Fish	71	675
Recreation	2	16
Special Uses	73	367
Corridors/Minerals	7	198
Roads/Facilities	286	405
SUB TOTAL	**1,215**	**20,215**
Noxious Weed	* 9,700	** 204,000
TOTAL	**10,915**	**224,215**

References: Responses to 2100/1950 letter to R-4 Forest Supervisors (11/29/88) requesting historic and projected data for Vegetation Management EIS.

* Acres treated in 1991.

** [illegible] Acres based on projections estimated in the 1986 Intermountain Region Noxious Weed EIS.

Pesticide and IPM Workshop

Summary of Chemical Families of Herbicides Used in Region 4

by Jack Evans
Utah State University

Phenoxy herbicides - Mostly active against dicot plants and safe on monocots. Primarily applied to foliage where they move within plants for action. They can be applied to soil but their movement into plants via soils is somewhat limited and they are degraded in soil in about 2 to 4 weeks. Auxin-type action in dicots causes leaf and stem twisting and curvature. Microorganisms degrade these herbicides quite readily.

Example: 2,4-D and 2,4-DP (dichlorprop)

Aliphatic herbicides - Appear to be more active on monocots as compared with dicots. Very short residual in soils so generally used as foliage sprays. Won't build up in soils with repeated use. Strongly attached to soil particles. Very low mammalian toxicity.

Example: dalapon, glyphosate

Benzoic acid herbicides - Very active on dicots and may injure some monocots. Strong antiauxin compounds that interfere with plant processes. Will last several weeks in soil and may move rather deeply into soils. Must use caution when applying near trees. Moderately toxic to most tree and shrub species.

Example: dicamba

Pyridine herbicides - Very active against dicots and usually safe on monocots. Active against shrubs and trees. Absorbed by leaves, stems and roots of plants and will move in soils with excess water. Relatively long residual in soils and may last beyond one or two growing seasons.

Examples: picloram, clopyralid, triclopyr

Carbamate herbicides - Short soil residue herbicides that are readily taken up by roots and leaves. Often sprayed on very small weeds or to soil at weed emergence. Very short soil residual won't move in soils. Selective control of small grassy and broadleaved weeds in reforestation. Usually safe on established plants.

Example: asulam

Amino triazole herbicide - Foliage absorbed herbicide with very limited soil activity. Nonselective herbicides which suppresses large perennial grasses and broadleaved weeds. Causes plants to become white over a period of several days. Limited ability to be translocated to underground plant parts.

Example: amitrole

Triazine herbicides - primarily soil applied, some with limited foliar activity. Active against most monocots and some dicots. Several months residual in soil and may move with soil water. Potent inhibitors of plant photosynthesis but little, if any, activity in other systems and very safe to mammals. Very broad spectrum of activity against numerous plant species.

Examples: simazine, atrazine

Uracil herbicides - generally non-selective herbicides except where they can be strategically placed in the soil for selectivity. Very broad spectrum of species controlled. Moderate leaching in soils allows these herbicides to control difficult established species. Enter plants via roots and virtually no foliage action.

Examples: bromacil, hexazinone

Urea herbicides - Most are soil applied and enter plant roots. Some have limited foliar uptake. Surfactants may significantly increase foliage penetration. Very broad spectrum of plants controlled since dicots and monocots are susceptible. Strong inhibitors of photosynthesis and tolerance is usually associated with translocation or metabolism differences.

Examples: diuron, tebuthiuron

Sulfonyl urea herbicides - Extremely active group applied to plant foliage in minute amounts. Express soil and foliage action. Some may last in soil for one or more seasons while others are very short lived in soil. Selectivity among species depends upon differential metabolism. These herbicides have a very specific site of active in plants and are subject to plant populations becoming resistant to them. Expect numerous new herbicides in this class.

Examples: chlorsulfuron, sulfometuron, metsulfuron

Imidazolinone herbicides - Generally non-selective unless plants metabolize parent product. Active against monocots and dicots with fairly long soil life. Very specific target site which may favor resistance in weed populations. Limited movement in soil water. Kills established and seedling plants.

Example: imazapyr

PESTICIDE STORAGE FACILITY INSPECTION CHECKLIST
(Permanent) or (Temporary)
(circle one)

Reference: FSH 2109.12, Pesticide Storage Handbook
FSH 6709.11 Health and Safety Code

(One copy of this form will be maintained
in the 2150 files of the responsible unit)

FOREST_____ DISTRICT_____ DATE_____
LOCATION of FACILITY_____ INSPECTOR_____

	Acceptable	
Permanent Pesticide Storage Facility:	YES	NO
1. Meets the requirements for facility development and operation (FSM 7310) and complies with local building codes and fire regulations?		
2. Located at least 50 ft. from other structures unless provided with an approved 3-hour fire-resistant construction?		
3. Equipped with explosion-proof wiring, equipment, and fixtures suitable for use in Class I, Division I locations as specified in the National Electrical Code?		
4. Constructed to contain spillage from the largest bulk container, or a 55-gallon drum, whichever is larger?		
All Pesticide Storage Facilities (Permanent and Temporary):		
1. Provides adequate protection to containers and contents from direct sunlight or wet weather?		
2. Locked to prevent entry by unauthorized personnel?		
3. An ABC-type (all purpose) portable fire extinguisher is installed at the facility in a readily accessible location?		
4. Pesticides are used up or properly disposed of by the end of the shelf life recommended by the manufacture (typically 2 years).		
5. Temperature and humidity of storage facility is maintained within pesticide manufactures' recommendations.		
6. Pesticides are stored away from food, feed, seed, potable water, clothing, paint, flammable liquids, or fertilizers (except, pesticide-fertilizer combinations)?		
7. Clean water (10 gallons) and soap are available for decontamination of personnel?		
8. An inventory of the stored pesticides are posted somewhere on the outside of the facility?		

	Acceptable	
	YES	NO
9. Proper identification and warning signs are posted to advise personnel of the contents of the stored material?		
10. Pesticides are stored in original container with labels plainly readable?		
11. Pesticides containing the same active ingredient are segregated and stored together with a sign displaying the common name of the active ingredient?		
12. Protective clothing, respirators, goggles, etc. are protected from contamination while not in use.		
13. The Chemical Transportation Emergency Center (CHEMTREC) toll-free telephone number (800-424-9300), the telephone number and location of the local poison control center, and 24-hour telephone numbers for the person(s) responsible for the storage site are posted?		
14. Storage area neat and orderly. Floors clean and trash absent.		
15. Facility has a safety plan which includes a Pesticide Spill Emergency Plan if storage is provided for more than 200 gallons or 400 pounds of pesticides?		
16. Emergency equipment (spill kit) on hand for spill cleanup?		

NOTE: Proper management of pesticides should limit storage time to less than one year even at permanent storage facilities. Only household type pesticides, small quantities of pesticides (1 pound active ingredient or 1 gallon of formulated product), or quantities of pesticides needed onsite for project operations can be stored in temporary storage facilities. Temporary storage facilities include research laboratories, fenced compounds, boxcars, empty paint sheds, store rooms, warehouses, etc., where provisions are made to prevent unauthorized entry or damage to the pesticide or pesticide containers by the weather. All storage sites should be located where flooding is unlikely and where contamination of any water system by runoff can be prevented

FSH 2109.12, Chap. 10

Comments: _____

Common Name	Trade Name	Solubility In Water	Half Life in Soil	Surface Runoff	Leaching
Herbicide	Name	PPM	Days	Potential	Potential
SIMAZINE	Princep, Simazine	3.5	75	Medium	Large
SULFOMETURON	Oust	10 (pH-5) 5,300 (pH-7)	60	Medium	Large
TEBUTHIURON	Spike	2,300	360	Small	Large
TRICLOPYR	Garlon 4, Turflon	430	46	Large	Medium
TRIFLURALIN	Treflan	0.3	60	Large	Small

SOURCE: Wyoming Weed Control Series, No. 1, Herbicides and Their Properties and Applications, College of Agriculture. B-442.1, University of Wyoming, Laramie, Wyoming.

COMMON NAME - Refers to an active ingredient without naming a specific product.

TRADE NAME - Typical name or names by which the ingedient is marketed.

SOLUBILITY IN WATER - This is the solubility of the pure active ingredient, not the formulated product. A large number means highly soluable. A small number means low solubility. Generally, herbicides with solubilities of 1 PPM or less will tend to stay near the soil surface and be washed off in sediment.

HALF-LIFE IN SOIL - The time required for herbicides in soils to be degraded so that their concentration decreased by one-half. Herbicide degredation can be fairly accurately described by assuming that each successive elapsed half-life will decrease the herbicide concentration by half. The numbers given should only be used as relative indicators of persistence. These half-lives are for herbicides in the interior of the soil and generally refer to chemical or microbiological degradation. Herbicides deposited on the surface or deposited on plant or crop litter surfaces, which remain there generally show half-lives of only a few days or less under these conditions.

RUNOFF POTENTIAL - This indicates the tendency of herbicides to move with sediment in runoff. A large rating means the herbicide has a high tendency to move with sediment.

LEACHING POTENTIAL - This indicates the tendency of an herbicide to move in solution with water and leach below the root zone into deep perculation.

LTH:5/92

HERBICIDES AND THEIR PROPERTIES

Common Name	Trade Name	Solubility In Water	Half Life in Soil	Surface Runoff	Leaching
Herbicide	Name	PPM	Days	Potential	Potential
AMITROLE	Amizole, Weedazol	280,000	14	Medium	Medium
ATRAZINE	Atrazine, AAtrex	33	60	Medium	Large
BROMACIL	Hyvar X	815	90	Medium	Large
CHLORSULFURON	Glean, Telar	300 (pH-5) 28,000 (pH-7)	30-Acid Soil 30+ -Alkaline	Small	Large
CLOPYRALID	Stinger, Curtail	Very Soluble	20	Small	Large
2,4-D (ESTER)	Several Names	900	10	Medium	Small
2,4-D (AMINE)	Several Names	890	10	Small	Medium
DICAMBA	Banvel	4,500	14	Small	Large
DICHLOBENIL	Casoron	25	30	Medium	Medium
DIURON	Karmex, Diuron	42	60	Large	Medium
GLYPHOSATE	Roundup	12,000	30	Large	Small
HEXAZINONE	Velpar	33,000	60	Small	Large
IMAZAPYR	Arsenal, Chopper	15,000	90	Small	Large
MEFLUIDIDE	Embark 2-S	566,000	2	Medium	Small
METSULFURON METHYL	Escort	.109 mg/ml	120	Medium	Large
PICLORAM	Tordon 22K	430	90	Small	Large
PROMETON	Pramitol	750	120	Large	Large

- - Continued - -

REGION 5

R-5 John Borrecco

PESTICIDE COORDINATOR'S REPORTS

Suggested Format for Regional, NA, and Station Reports to be Presented at the 1992 Pesticide Coordinator's Meeting

1. Purpose of Report: To share pesticide related activities and information with pesticide coordinators from other Regions, NA, and Stations

2. Scope of Report: Actions, projects, challenges, and needs related to pesticide activities.

3. Time Period: February 1990 - September 1992.

4. Items: . Overview of Regional program:

Major effort has concerned the implementation of the Region's FEIS for Vegetation Management for Reforestation. This has involved development of site-specific EAs and project implementation, support to the DOJ on the litigation of the FEIS, completion of a risk assessment on inert ingredients (actually impurities) in several herbicide products, and handling appeals and congressional inquiries on the decisions.

Since January of 1991 we have implemented 10 projects resulting in about 9,000 acres being hand treated with the herbicides glyphosate, triclopyr, or hexazinone. An additional 10,000 acres are scheduled for treatments this fall and spring under these projects. Six of the projects have resulted in 10 forest level appeals and 2 regional level appeals. Several congressionals have also resulted from two projects.

An additional 11 projects are in various stages of planning ranging from decisions pending signature to initial scoping efforts. The scope of these projects will also be expanded in that aerial applications will be proposed in several projects, two projects will require EIS documentation, and herbicide use will be addressed in two timber sale NEPA documents.

Personnel at the District, Forest and Regional Office levels have worked with OGC and DOJ on preparation for the suit against the region's FEIS by writing declarations and providing technical advise. The lawsuit, SRCC vs. Robertson, is in the US Ninth Circuit Court of Appeals; the Forest Service won on all substantive issues in a June 1992 Federal District Court decision. In July, the plaintiffs requested a temporary injunction against herbicide use until the Ninth Circuit makes its decision. In a August 27 decision the Ninth Circuit denied the temporary injunction request, so we can continue to implement the FEIS. No hearing date has been set by the Ninth Circuit.

Completed a "Risk Assessment for the Impurities 2-Butoxyethanol and 1,4-Dioxane Found in Garlon 4 and Roundup Herbicide Formulations" in February 1991.

Completed a Region-wide EA for "Rust Resistant Sugar Pine Protection" from attack by the mountain pine beetle in April, 1990. Forests are implementing as needed.

Technology Development Projects related to pesticides:

Regional pathologists have initiated various efficacy studies under California Research Authorizations (State EUP) including: a efficacy study of a liquid formulation of borax for control of anosus root disease, a study of the efficacy of Bayleton in protecting western red cedar seedlings from cedar leaf blight, and the efficacy of thiophanate methyl as a replacement for benomyl to control Septoria leaf spot on alder. Results of the Bayleton studies have led the Region to request the manufacture to add western red cedar seedlings in nurseries to the Bayleton 25% Turf and Ornamental label. The Company has requested a Special Local Need registration from the State to meet our needs.

Partnerships with Research and/or cooperators:

Worked in cooperation with PSW on a study of the "Effectiveness of pyrethroid insecticides for protection of ponderosa pine from attack by western pine beetle". Results indicate that esfenvalerate and cyfluthrin were efficacious.

Developed a strong partnership and Challenge Cost Share Agreement with the California Department of Health Services for survey, detection, and suppression of vector borne diseases (primarily plague) in campgrounds.

The Eldorado NF and PSW Station are conducting a cooperative study on hexazinone movement and persistence in a small watershed.

The Eldorado NF cooperated with Mike Newton, OSU on a NAPIAP study on the efficacy of herbicide drop size for glyphosate and tryclopyr

Issues, needs, problems, challenges, and opportunities:

Monitoring is a major challenge. We need help in establishing a worker monitoring program and hope to involve the California Department of Pesticide Regulation. The Region is also experiencing problems with soil monitoring results, especially with triclopyr. We need help in obtaining spiked samples and perhaps a Regional contract lab.

5. Needs: . What do Regions and NA need from WO/FPM to do their job during the 1990's?

We need standardized risk assessment guidelines.
We need information gathering and disemination.

REGION 6

PESTICIDE REPORT

PACIFIC NORTHWEST REGION

NATIONAL PESTICIDE COORDINATOR'S MEETING, 1992

PESTICIDE PROJECT HIGHLIGHTS

1990

AERIAL APPLICATIONS

Pesticide Used:	B.t.k. (Thuricide 48LV)
Target Pest:	Western Spruce Budworm
Units Treated:	70,800 ac.
Location:	Yakima Indian Reservation

OTHER

Field trial (Roger Sandquist, R6-FPM):

Pesticide Used:	Esfenvalerate
Target Pest:	Cone and seed insects
Units Treated:	1,228 seedtrees
Location:	Willamette NF

Three Forest Service tree nurseries and one tree improvement center resumed herbicide use as part of their IPM program for all pests, following the Regional Nursery Management FEIS (Oct., 1989).

1991

AERIAL APPLICATIONS

Pesticide Used:	B.t.k. (Thuricide 48LV)
Target Pest:	Douglas-fir Tussock Moth
Acres Treated:	116,100 ac
Location:	Wallowa-Whitman N.F.

1992

AERIAL APPLICATIONS

Pesticide Used:	B.t.k. (Thuricide 48LV)	B.t.k. (Foray 48B)
Target Pest:	Western Spruce Budworm	Asian Gypsy Moth
Acres Treated:	186,600 ac.	124,500 ac.
Location:	Wallowa-Whitman & Umatilla NF's	Tacoma and Portland Coop with APHIS, and OR and WA states

OTHER

Three National Forests resumed herbicide use for vegetation management, following the process described in the Regional FEIS and Mediated Agreement. Two forests treated small acreages with glyphosate to control competing grasses. A third forest applied picloram by air to 200 acres to control a noxious weed. This application was part of a larger, cooperative treatment to improve elk winter range on both public and private lands.

TECHNOLOGY DEVELOPMENT PROJECTS

R6-FPM is supporting the development of comprehensive vegetation management models by Oregon State University. The models will, for each ecological subregion:

Synthesize information on interactions of principal competing species to predict growth responses.

Compile efficacy and economic information about the range of treatment methods, including both herbicides and nonchemical controls.

The two models will be integrated and linked to Forest Service inventory procedures to provide district silviculturists a means to evaluate treatment alternatives on a site-specific basis.

OTHER ACTIVITIES

--Guide to Conducting Vegetation Management Projects in the PNW Region

R6-FPM assembled teams with National Forest experts and cooperators to write this implementation guide. The guide presents and explains the requirements of the FEIS and Mediated Agreement for planning and implementing vegetation management projects.

--Vegetation Management Annual Meetings

R6-FPM has sponsored two meetings to discuss issues and new information about vegetation management in the PNW Region. These meetings included the signers of the Mediated Agreement, and were open to the public.

--Amended ROD for Vegetation Management FEIS.

The amendment removed restrictions on women working on certain herbicide applications, based on a low Margin of Safety for reproductive health effects. The restrictions appeared to be inconsistent with a recent ruling of the U.S. Supreme Court. The amendment added new requirements for worker information and protective equipment to reduce exposure of all workers applying these herbicides.

--Herbicide Applicator Training

R6-FPM conducted three training sessions in 1991-92 to train National Forest personnel and cooperators in herbicide application principles and practices using the FEIS direction. Approximately 90 students attended this training.

--Vegetation Management Literature Search and Review

R6-FPM has contracted to search scientific and anecdotal literature for new information concerning vegetation management methods, including herbicides available for use. Relevant articles will be evaluated for quality and significance to the findings and requirements of the Regional FEIS.

--Forest Nursery Pesticide Guide

Regional FPM staff are revising a guide of available pesticides for forest tree nurseries in the Pacific Northwest. The guide will be distributed to both Forest Service and non-Federal nurseries.

ISSUES

--During the 1992 Asian gypsy moth eradication project, citizens and activists raised concerns about various effects of B.t.k.:

What are the possible human health effects of B.t.k. full formulations, and the inert ingredients therein?

What are the risks of the B.t.k. and contaminants as biologically active organisms to immunocompromised people in sprayed areas?

What are the ecological effects from B.t.k. mortality of non-target insects?

How effective is suppression of natural insect populations with B.t.k. in restoring forest or ecosystem health?

--How much does new herbicide application technology (e.g.: E-Z-Ject stem injector for glyphosate) reduce worker (and public?) exposure to herbicides? What revisions are needed to Forest Service risk assessments and FEIS mitigatin measures?

--How effective is chlorine bleach as a disinfectant/fungicide to prevent introduction of Phytophthora lateralis to uninfected stands of Port-Orford-cedar?

NEEDS

More frequent information sharing of National-level activities, legislation, and regulation that may affect Regional pesticide-use programs.

REGION 8

PESTICIDE COORDINATOR'S REPORT

REGION 8

FOREST PEST MANAGEMENT

Regional Office:

Jim Brown has assumed the mantle of Regional (Technical Assistance) Tourist passed down by Max Williamson -- he makes upwards of 30 field visits (1 day to 1 week) and untold phone calls redeeming the FPM technology transfer role with respect to prescription and proper use of herbicides.

Have currently 425 R-8 Certified R-U-P Applicators, of whom 300 have been either certified (40 hr training) or recertified (8 hr training) during the last two years.

FOIA's -- have responded to a variety of FOIAs during the past year. We answered 7 pesticide related FOIAs in the past year, up from 4 the previous year. Only one, that from Asante Riverwind which all regions received, took significant (more than 8 hours) time.

Appeals -- We continue to be the recipient of "second level appeals" which involve pesticide prescriptions. Of the ten E.A.s involving herbicides challenged at that level during the past two years only one was remanded as inadequate.

Litigation - FPM pesticide shop has become the heir apparent to the technical defense of the Vegetation Management EISs in the Region. This has involved us in three lawsuits currently ongoing in Arkansas. All challenge linkage of the VMFEIS to the Forest Plan (inappropriate separation of the documentation). Two of them challEnge technical information presented in the Risk Assessment.

Closed out a SARA third-party-involved suit in KY; Forest Service used a local dump from which unacceptable discharge of chemicals was occurring. Allegation placed responsibility with three companies, but, under SARA we were brought into the suit. Suit is closed by court agreement subject to "reopener" if further unacceptable discharge occurs. No punitive damages assessed of the Forest Service.

HAZMAT -- actively participate in Regional HAZMAT Team; developing standards and guidelines for the Regional HAZMAT training program. Also, developing SOPs for pesticide handling, storage, use, personnel cleanup, etc. Two of us (Jim & I) have just participated in a forty hour HAZWOPER training session at the Savannah River Plant.

Developing clopyralid risk assessment/EIS -- using the R-West (R-1, -2, -3, -4 -10 & BPA) risk assessment draft.

Attempting to revise the ROD for all three sub-Regional VMFEISs; to correct three problems identified which relate to ROW's. Mitigation measure revision only -- appears that the analysis is adequate.

Completed negotiation with the Arkansas Wildlife Federation which resulted in withdrawal of their appeal of the VM FEIS O/O.

T&E species/pesticide interface - Continue to participate in the EPA/FWS effort to propose acceptable pesticide criteria relating to endangered species. Also participating in the Georgia effort to define appropriate protocols at the state level.

Technology development projects ongoing:

1. Forest dissipation of bifenthrin (under GLP protocol) for registration as a seed orchard pest control insecticide.
2. Development of a device to simulate aerial pesticide application to single trees; in conjunction with Texas Forest Service and University of New Mexico.
3. Evaluating the possibility of using pheromones to disrupt mating of Dioryctria disclusa; promising early results.

Providing technical support to a southwide study evaluating the effect of a reduced Guthion rate on seed orchard pests; cooperating with the Southern Seed Orchard Pest Committee, The Southern Forest Tree Improvement Conference, the Western Gulf Tree Improvement Coop, the North Carolina State Tree Improvement Coop, and the Florida IPM Coop.

SRP herbicide environmental fate study in progress evaluating four commonly used site prep herbicides; Garlon + Tordon, Velpar ULW, and Arsenal.

Field OFfices:

SPB status & Suppression methodology; essentially no pesticide is being used here.

AIPM work; about 95,000 BIUs B.t. on approx 4,000 ac in FY'91. Also about 8,000 BIUs disparlure on 300 ac. FY'92 data not yet available.

Gypsy moth eradication at Compton, AR in conjunction with the state (planned for next spring)

Propiconazole (Alamo) is being used as part of the oak wilt suppression effort in Texas; reasonable success but not a silver bullet. More information will be available in the project evaluation report.

NATIONAL FOREST SYSTEM

General:

Treated approximately 85,000 acres for vegetation control (site-prep, release, etc.) in FY'91 -- down from 100,000 acres in FY'90. Virtually all of this treatment acreage is done in low-impact treatments (individual stem treatments [cut surface, stump, backpack foliar, etc.]) Broadcast application is virtually dead in R-8; except for roadside and some other ROW maintenance.

FY'91 -- triclopyr use averaged 1# a.i./acre on just under 60,000 acres, hexazinone averaged 1.5# a.i./ac on about 11,00 acres and glyphosate averaged .8# a.i./ac on 6,700 acres. Also used were imazapyr, sulfometuron methyl and fosamine to account for the remaining acres.

Caribbean NF:

Currently has no active pesticide program.

Chattahoochee-Oconee NF:

Working with Max Williamson to evaluate clopyralid efficacy on kudzu

Working with Max W., Dow-Elanco and JLB to determine if vegetable oils (methyl oleate [Dow-Elanco]; sunflower oil [JLB]) are adequate substitutes for kerosene, diesel oil, naptha, and a variety of other mineral oils currently used in formulation and application. Results to date are extremely promising!

Cherokee NF:

Routine use; public becoming active in opposing use of pesticides.

Daniel Boone NF:

Testing the efficacy of Krenite-S as a pruning agent to remove epicormic branching from the butt logs of potential high-value hardwoods following thinning and shelterwood harvest cuts.

Francis Marion-Sumpter NF:

Working with Max Williamson to evaluate clopyralid efficacy on kudzu.

Continues to respond to specialized needs of balancing "wetland" and T&E (Red cockaded woodpecker) considerations with the need to regenerate massive acreage downed by Hugo. This process has been ongoing since the hurricane. It has presented many challenges and opportunities. One problem -- too much pine regeneration on-site has led to a rethink of many processes.

George Washington NF:

Very limited program (250 ac conifer release) in FY'91. Do not foresee a significant increase in use.

Jefferson NF:

Highly unusual disposal problem. Acquired a country store closed in the late forties (?early fifties) in a land exchange. Contents of store essentially intact as at the time of closure, including a supply of pesticides. Archaeologist has determined it to be of historic value, so, could we arrange disposal of the pesticides BUT decontaminate and save the packages to allow them to be returned to the shelves, retaining the ambiance of the store?

Kisatchie NF:

Not much use of pesticides, but is developing a prescription for competition control in longleaf pine plantations using the herbicides approved in the VMFEIS.

Ongoing investigation at the site of the former pesticide storage building. Currently the site is declared a "pesticide waste site" based on the presence of higher than acceptable concentrations of lindane (the various -HC [AHC, BHC, GHC, & DHC] breakdown products) and 2,4,5-T & its breakdown products. Contractor performing further sampling; will then recommend remediation process.

NF in Alabama:

Evaluating the efficacy of Hygrade I (mineral oil) as a substitute for diesel/kerosene.

NF in Florida:

Three exotic invasive species problems which are being worked on in an attempt to determine adequate control measures:

- Cogon grass control
- Melaleuca control
- Brazilian pepper control

In addition titi (three native species) continues to be a management problem without adequate solution.

We have now a prescription for the control of palmetto and also have found that (at proper rate) Velpar can be used to regenerate the desirable wiregrass/longleaf type.

Have discovered a septic field contaminated with chlordane. Cleanup is progressing on this.

NF in Mississippi:

Continues to have an active herbicide program; 10% of the 15,000 acres treated were wildlife habitat improvement treatments.

Placing more emphasis on kudzu control; working with Max Williamson to evaluate clopyralid efficacy.

Doing and permitting earthen dam cleanups (devegetation). Poses herbicide selection problems since we lack an aquatic pesticide EIS.

Having problems with forestry mitigation measures in the VMFEIS as they affect ROW maintenance by permittees.

NF in North Carolina:

Developing a test protocol to determine the utility of herbicides in reclamation and maintenance of high mountain balds. Poses many special management and legal opportunities.

NF in Texas:

Essentially no pesticides used in the forest during the past several years.

Ouachita NF:

Lawsuit primarily challenging clearcutting, but including an attack on the VMFEIS O/O.

Ozark NF:

Working with Max W., Dow-Elanco and JLB to determine if vegetable oils (methyl oleate [Dow-Elanco]; sunflower oil [JLB]) are adequate substitutes for kerosene, diesel oil, naptha, and a variety of other mineral oils currently used in formulation and application. Results to date are extremely promising!

Dealing with two lawsuits attacking the NFLMP/VMFEIS interaction (see R.O. writeup).

NEEDS:

1. Rethink contracting for the procurement of pesticides. Distributors are being given (essentially) fixed sales prices by manufacturers with active encouragement to provide services as the differentiating value between themselves and their competitors. However, this is not an allowable criterion in federal bidding so we have tie bids from all distributors of a given product in our procurement process.

2. Proactively encourage distributors to take back (at our cost, if necessary) empties. They could clean and reuse or dispose of the containers in a better manner than is currently done.

3. Improved Risk Assessment process. LAI is becoming a hurdle in the process rather than a useful tool. Either we need to develop other sources which are more timely in their production, or we need to develop our own process to allow Risk Assessment to be done in-house in a more responsive manner. At present R-8 is holding back on several potential assessments pending the completion of the seed orchard assessment -- which is only now getting underway. We need a RA for methyl oleate, one for sunflower oil (both are vegetable oil substitutes for kerosene and diesel oil), one for "Penevator" and one for "Hy-Grade" and for "Hy-Grade II" (or at least a quick review of the latter two to determine probability of acceptability as substitutes for the two mineral oil fractions currently in use.)

   As a subset of the RA problem we need a clarification of just how detailed a process of risk assessment is needed if a product is cleared for use as a food additive by FDA. We have three clear cases of this question: sunflower oil, methyl oleate (a vegetable oil), and red dye #28 which has a D&C clearance under the FDA. Are FDA tests done to achieve these ratings? Are things like LD_{50}, and other toxicity reference tests performed? Are the test results available for our review and use?

4. "Short Subjects and Timely Tips" reactivated to alert the Regions to important information relevant to the pesticide program.

5. Clarification of the status of the Forest Service's Restricted-Use-Pesticide Applicator Certification program. What is our relationship to state certification programs supposed to be? Does it vary from state-to-state or is our training appropriate for all Forest Service lands/applications? Does our authority change from state-to-state? Was our initial authority restricted to five years? Longer? Has it been renewed as needed or are we in the twilight zone of FIFRA?

5a. Are we supposed to file any significant update to the program to the Department per 40 CFR 171.7(E)(2)(d)(1)(iv). Annual report of certified personnel as at 40 CFR 171.7(E)(2)(d)(1)(i) and form FS-2100-4.

6. Update or create and maintain listings of "approved" <u>disposal facilities</u> for obsolete or surplus pesticides, AND of "approved" <u>testing labs</u> which are capable of pesticide residue analysis during project or program monitoring. In light of the GLP protocols now in force for registration data the latter problem is of great concern.

7. One of the biggest needs in the herbicide program is for FPM to open the technology development $ pot to herbicide projects. There is significant missing data on ecological effects which is ineligible for NAPIAP $s (not necessary for registering the product) and also is ineligible for TD $s (specifically excluded in the call letter for project submission). Most of this work is not getting done! and, it is very likely to cost us the program in the not-so-distant future.

8. As a specific example of things not getting done -- we need information on the residual plant population after herbicide treatments. We can state with reasonable assurance what the treatment will kill ("efficacy"), but we do not have good data describing subsequent plant populations and successional patterns. This is a critical need right now.

   Note: In Region-8 at least two NAPIAP projects currently funded fall into this category -- but they are linked directly to registration requirements (food/cover/nesting value of residual vegetation to game, non-game, and T&E species of animals). This is a good start -- but we need to find $s to fund non-registration data studies concerned with ecological effects.

9. What is the status of FSH 2109.14 reviewed approximately 9 months ago. Is revision being done? When can we expect it? Will the section on risk assessment be added prior to release or is it in limbo?

10. We need a completed EIS/risk assessment combination for our nurseries, our seed orchards and for aquatic pesticides. We recognize that the first two are in process -- but when can we expect them?? As for an aquatic pesticide RA we resurface this need recognizing that a decision was made prior to Larry Gross' retirement that a national R.A. would not be done for aquatic pesticides. We feel that a national R.A. should be done with regions then able to tier EIS analyses to it.

11. Having now broached the subject of risk assessment, it is time to ask if the Forest Service does not now have the expertise to do it themselves for pesticides. Specifically, has LAI outlived its usefulness to us? Should we, rather than spending hundreds of thousands of dollars to reinvent the R-6 basic LAI Risk Assessment (it was R-8's starting point, and despite all of the changes made during the R-8 process [literally a thousand plus] the current R-1, -2, etc. appears to have started at the same place!) move on to generic risk assessment which could be adapted -- by us -- to regional needs?

12. We need national protocols for monitoring -- or at least some national direction as to minimum intensity and frequency of sampling -- so as to assist the Forests in their M&E efforts.

13. We need some sort of consistent rationale for valuing forest outputs such as wildlife habitat improvement, dispersed recreation, etc. It is currently almost impossible to compare alternatives with either only tangible or only intangible benefits with each other or with an alternative which has a mix of outputs. Confusing the process is the need for valuation of such things as ecological improvement, wildlife habitat improvement, ecosystem management, etc.

REGION 10

Pesticide Report 1990-92

FOREST PEST MANAGEMENT
Region 10 (Alaska)
&
INF/PNW, Fairbanks

A. Title: *Biochemical, behavioral, and meteorological factors associated with carbaryl selectivity toward western bark beetles.*

Funded by FPM and INF in cooperation with N.C. State.

Start: August 1988
Terminate: April 1992

Objectives:

1. Compare the difference of carbaryl (Sevin®) in penetration and metabolism to southern pine beetles and spruce beetles.

2. Compare contact toxicity of carbaryl deposits to southern pine beetles and spruce beetles on bark and filter paper surfaces.

3. Determine through enzyme assays the key enzymes involved in the biological detoxification process of carbaryl.

Conduct experiments to identify the potential metabolites and metabolic pathway of carbaryl in southern pine and spruce beetles. This will require the development of HPLC methodology to measure carbaryl residue and its metabolites on bark under different temperature and humidity in the laboratory. A test of toxicity will allow a comparison of direct contact toxicity versus contact toxicity which incorporates a cofactor of beetle behavior, .i.e., beetles can crawl under or bore within the bark but do neither on filter paper.

B. Title: *Rehabilitation and competition studies on deforested land in interior and south-central Alaska.*

Funded by FPM and INF in cooperation with Oregon State University.

Start: June 1989
Terminate: April 1993

Objectives:

1. To establish a series of statistically designed plots on which long-term measures of plant competition can be developed in white spruce stands at Bonanza Creek Experimental Forest in interior Alaska and in Lutz spruce stands on Ft. Richardson Military Base in south-central Alaska, and in maritime Sitka spruce stands at Windy Bay on the Kenai Peninsula, Alaska.

2. To develop the methodology by which species composition and density can be managed according to the findings in Objective 1.

3. To develop methodology for enhancing browse and/or forage values to co-exist with reforestation prior to stand closure.

4. Determine if vegetative competition slows juvenile growth of white spruce seedlings on upland sites in interior Alaska and Sitks spruce in south-central Alaska.

5. Reconnaissance of areas on Chugach NF for a 1991 study to enhance wildlife habitat using herbicides and/or other manipulative procedures, and formulation of study plans.

The herbicides glyphosate, hexazinone, 2,4-D, triclopyr, and imazapyr were used in this study and compared to mechanical treatment (hydro-axe, hoe-dad, chain saw, cat scarification, etc.) measures as well as untreated controls. Both liquid and granular formulations were used.

C. Title: *Comparison of semiochemicals for mass trapping spruce beetles in interior and south-central Alaska.*

Funded by FPM (WO) as a Technical Development Study.

Start: May 1988
Terminate: September 1990

Purpose:

To develop operational strategies for monitoring and manipulating spruce beetle populations using semiochemicals in traps and on baited trees in interior and south-central Alaska.

This project is part of a larger international project in which the Institute of Northern Forestry and Forest Pest Management (R10) cooperated with Forestry Canada, the University of Calgary, Simon Fraser University, and Phero Tech. This project has two phases:

Phase I: Development of New Semiochemicals

(a) To develop and optimize pheromone blends for attracting spruce beetles to traps and baited trees.

(b) To determine the semiochemicals which deter spruce beetles from entering into traps or from attacking baited trees.

(c) To determine the best release rates of the pheromone blends that are attractive to the spruce beetle.

Phase II: Operational Use of Semiochemicals

(a) To develop strategies for monitoring endemic spruce beetle populations using pheromones in traps and on baited trees.

(b) To develop strategies for effective beetle management using aggregation and antiaggregation pheromones.

Phase I in 1988-1990 dealt with the development of an improved pheromone blend for attracting spruce beetles. This phase included field tests on the efficacy of the new formulations and was conducted in northern

and southern Alberta, British Columbia, and south-central and interior Alaska using similar testing methodologies. Release rates were tested in 1990 but only in interior Alaska to obtain a precise release rate for (+) MCOL. The test compared the commercial ternary lure at a release rate of alpha pinene at 0.7 mg/day and frontalin at 0.1 mg/day, with different release rates of (+) MCOL at 0.6, 1.2, 1.5, 3.0, and 4.5 mg/day. Results indicated that alpha pinene + frontalin + (+) MCOL at 3.0 mg/day provided the best catch of beetles in interior Alaska. The (+) and (-) enantiomers of MCOL were also tested; the highest number of beetles were caught in traps baited with the (+) enantiomer. A third test compared the (R) and (S) enantiomers of verbenene. There was no significant difference between individual or combination of treatments.

D. Title: *Operational strategies for manipulating populations of spruce beetles.*

Funded by FIDR (WO) as a Western Bark Beetle RD&A study.

Start: May 1992
Terminate: September 1995

Phase II of study D above was scheduled for 1991-1993 and is proposed to demonstrate the efficacy of pheromone methods utilizing improved formulations for manipulating spruce beetle populations in various management strategies.

Objectives:

1. Obtain a reliable estimate of the resident population of spruce beetles in the study areas. An evaluation of the various experiments depends on the size of the beetle population which needs to be trapped.

2. Test several trapping strategies for reducing the number of SB from stands of spruce with increasing populations of beetles using the ternary spruce beetle lure: 1-methylcyclohex-2-enol (MCOL), frontalin, and alpha pinene. This will involve trap-out, spot baiting, and barrier trapping methods.

In 1991, a final evaluation of the efficacy of the ternary formulation (alpha pinene at 0.7 mg/day, frontalin at 0.1 mg/day, and (+) MCOL at 0.5 mg/day) of spruce beetle pheromone for operational use in management of beetle populations in interior and south-central Alaska. This included trapping with Lindgren funnel traps and tree-baiting experiments. The ternary lure caught significantly more spruce beetles in traps than the binary lure alone; however, the binary formulation attracted more beetles to baited trees than the ternary lure.

In 1992 field experiments were conducted in stands of Lutz spruce on the Kenai Peninsula between Kasilof and Ninilchik east of the Sterling Highway. Infested and uninfested spruce stands with recent logging, proposed logging, or no logging activity were used. Study areas included land managed and owned by the Forest Service, State of Alaska, University of Alaska, Kenai Peninsula Borough, Ninilchik Native Association, Inc., and Cook Inlet Region, Inc.

E. Title: *Aerial and ground application of 3-methylcyclohex-2-enone (MCH) to reduce tree mortality by spruce beetles in south-central Alaska.*

Funded by FPM (WO) as a Technical Development study in cooperation with PSW.

Start: May 1991
Terminate: September 1994

Objectives:

1. To test the efficacy of aerially or ground applied 3- methylcyclohex-2-enone (MCH) in a bead formulation to prevent the infestation of tree-length log decks by spruce beetles.

2. To determine the efficacy of MCH bubblecaps to protect high-value spruce trees in a campground from infestation by spruce beetles.

MCH was formulated into a controlled release bead consisting, by weight, of an inert polyethylene bead (98%) charged with 2% MCH. This amount of formulated bead eluted from 0.25 to 2.5 g MCH/ha/day for 60 days. Previous studies in Alaska had shown that field elution rates of the formulated plastic bead in a cool environment were 50% of the rates reported elsewhere; therefore, two dosage rates were tested in this study: 4.6 and 9.2 kg/ha.

Objectives:

1. To test the efficacy of MCH bubble caps in preventing spruce beetle attacks on standing, uninfested spruce in a campground on the Kenai Peninsula.

F. Title: *Dispersal of spruce beetle and Ips engraver beetles in Alaska.*

Funded by PNW and FPM (R10)

Start: May 1991
Terminate: September 1993

Objectives:

1. To develop methods to mark-release-recapture spruce beetles and *Ips perturbatus*.

2. To determine the dispersal pattern of beetles from infested trees and bolts and other release devices.

3. To determine the distance scolytid beetles disperse in spruce stands of interior and south-central Alaska.

The aim of this research was to estimate the percentages of local spruce beetles and *Ips perturbatus* populations that could be marked, released, and recaptured in pheromone-baited traps set at various distances and in different directions from the hibernation sites or other point of dispersal. The pheromone used for spruce beetle was the ternary lure composed of 1-methylcyclohex-2-enol (MCOL), frontalin, and alpha pinene; the pheromone used for *Ips perturbatus* was ipsdienol. Both pheromones were dispersed in slow-release formulations from Lindgren funnel traps.

G. Title: *Use of pheromones to increase interspecific competition between spruce beetle and other bark beetles (Scolytidae) inhabiting white, Lutz, and Sitka spruce in Alaska.*

Funded by FPM (WO) as a Technical Development study.

Start: May 1991
Terminate: September 1993

Objective:

1. To test the feasibility of using scolytid pheromones to increase interspecific competition with SB in order to reduce SB brood production and survival in felled trap trees.

A field test was done in 1991 in interior and south-central Alaska to test the feasibility of using scolytid pheromones to increase interspecific competition with spruce beetles in order to reduce brood production and survival. This test used Lindgren funnel traps baited with pheromones from spruce beetle (alpha pine + frontalin + MCOL), *Ips perturbatus* (ipsdienol), *Dryocoetes affaber* (*exo*-brevicomin), and *Polygraphus rufipennis* (methyl butenol). *Exo*-brevicomin alone with spruce beetle pheromone and in combination with *D. affaber* and *I. perturbatus* pheromones shut down the attractiveness of the spruce beetle pheromone; whereas, ipsdienol in combination with spruce beetle pheromone had a similar effect but to a lesser degree. Methyl butenol had no effect on SB when tested alone with the SB pheromone or in combination with IP and DA pheromones.

A similar field test was conducted in 1992 but felled spruce trees were baited with the same pheromones except the methly butenol.

NAPIAP Funded Research (FPM/R10 is a cooperator)

A. Title: *Comparative dissipation of forest herbicide residues in temperate and subarctic environments.*

INF Cooperative Research Agreement with Oregon State University.

Start: May 1991
Terminate: May 1994

Objectives:

1. Develop comparative rates of dissipation for 2,4-D, triclopyr, glyphosate, hexazinone, and imazapyr on soils and vegetation in forested sites in Alaska and the Pacific Northwest.

2. Estimate mobility of hexazinone and triclopyr in soils on high rainfall coastal forest sites.

3. Develop general models of herbicide persistence based on soil temperature, water content and leaching applicable for Pacific Northwest and Alaska.

Plots established and treated in 1991 and 1992. Soil and vegetation samples collected and awaiting chemical analysis by Oregon State University.

B. Title: *Is persistence the cause of differential efficacy of carbary on the bark of loblolly pine and Lutz spruce*?

INF Cooperative Research Agreement with North Carolina State University.

Start: April 1992
Terminate: April 1993

Objectives:

1. Develop HPLC methods to measure carbaryl residue and its metabolites on the bark of loblolly pine and Lutz spruce and on the exoskeletons of the southern pine beetle (SPB) and spruce beetle (SB) under different controlled temperatures and humidity in the laboratory.

2. Evaluate the effects of carbaryl on host selection by the SPB on loblolly pine and the SB on Lutz spruce.

3. Compare the difference in persistence of carbaryl in regards to penetration and metabolism on the host species and on the exoskeletons of the beetles, identify the potential metabolites, and determine the metabolic pathway of carbaryl in the beetles using the new HPLC methods.

4. Identify the effects of temperature, relative humidity, and bark penetrability using the new HPLC methods on the degradation of carbaryl and its metabolites on bark of the host trees.

5. Compare the rate of degradation of carbaryl residues in forest floor litter and soils on sites with warm (North Carolina) and cold (Alaska) climates.

Carbaryl insecticide is very effective in protecting Lutz spruce trees from attack by spruce beetles in Alaska but does not protect loblolly pine from attack by southern pine beetles in North Carolina. Multiple factors could

effect the persistence or degradation process in these species located in two climatically different ecosystems. Carbaryl (2%) residue on bark of loblolly pine decreased from 3227 ppm to 1292 ppm; whereas, residues increased from 3650 ppm to 4325 ppm in 12 months before decreasing to 2100 ppm at 16 months and 1693 ppm at 27 months on the bark of Lutz spruce trees in Alaska. Carbaryl was very toxic to SPB when beetles were subjected to filter paper treated with various concentrations of the insecticide, i.e., 1% carbaryl killed 90 percent of the beetles in 48 hours with a LC_{50} of 0.01. The same tests using loblolly pine bark indicated, however, that carbaryl was less toxic to SPB because the LC_{50} was 1.0 and it required a concentration of 2.5% carbaryl to kill 90 percent of the beetles in 48 hours. It was concluded that this difference in mortality between SPB and SB was related to differences in the penetration, excretion, and metabolic processes of carbaryl within the beetles.

A high performance liquid chromatographic (HPLC) was developed for the determination of carbaryl and its hydrolysis product 1-naphthol and other metabolites of carbaryl on the exoskeletons of SPB and SB, within whole body homogenates, and within the incubation chamber in order to be suitable for the next step in this research; that is to determine the metabolic pathway and environmental degradation.

NEEDS

--Continue support for development and operation use of semio-chemicals.

--Clarify, re-define(/), expedite semio-chemical registration--
ex.--what happen to MCH registration??

--Continue pesticide newsletters from W.O.!!!!

NORTHEASTERN AREA

PESTICIDE COORDINATORS' REPORT
NATIONAL PESTICIDE COORDINATORS MEETING
SALT LAKE CITY, UTAH
SEPTEMBER 29 - OCTOBER 2, 1992

PURPOSE: This report is prepared for the National Pesticide Coordinators Meeting, held September 29 - October 2, 1992 in Salt Lake City, Utah. Its purpose is to share information of interest with pesticide coordinators from other Regions and Stations.

SCOPE The report provides only the highlights of State & Private Forestry activities that occurred in cooperation with various agencies and federal land managers operating within the 20 state Northeastern Area. Specific details of these and other activities are provided in various attachments and handouts which were distributed at the meeting.

TIME PERIOD: January 1991 through October 1992.

ITEMS: **SUPPRESSION PROJECTS**: (Ref. Gypsy Moth News July Issue #29)
In FY 1992, NA, in cooperation with 11 different state and federal agencies treated more than 790 thousand acres to suppress the Gypsy Moth. The primary pesticide used was Bt, (610,699 acres) - this represents 78% of all acres treated. Dimilin was used on 175,922 acres, and approximately 700 acres were treated with Gypchek.

HIGHLIGHTS OF SUPPRESSION PROJECTS - 11 Projects totaling 790,791 acres were sprayed with Bt and/or Dimilin. There were no major incidents or accidents reported.

State Cooperators	58,177 acres
Other Federal	7,182 acres
National Forests	25,432 acres
Total Acres Sprayed	790,791

NAPIAP PROJECTS: (REF. See Project Summary Sheets)
NA managed approximately $274,000 in **NAPIAP** Grants during the past two fiscal years. Three (3) projects were completed in FY'92; two (2) existing projects were refunded and are continuing from previous years' funding; and two (2) new **NAPIAP** projects were funded in FY'92.

COMPLETED PROJECTS:

NA-21 ASSESSMENT OF GARLON 4 ON FISH AND STREAM INSECTS.

This was cooperative study involving Lake Superior State University, Forestry Canada, and the USDA Forest Service. Forest Service costs totaled $21,870.

Conclusions showed that Garlon 4 contamination of water bodies does not present risk of direct, acute effects on aquatic insects, even at maximum expected environmental concentrations. However, there appears to be no margin of safety for fish (rainbow trout and Pacific salmon) exposed to standing bodies of water contaminated with Garlon 4.

Publications are available from David Kreutzweiser, Forestry Canada; Forest Pest Management Institute, Sault Ste. Marie, Ontario, P6A 5M7.

NA-16 TOXICITY TESTING OF FOREST PESTICIDES ON NON-TARGET AQUATIC INVERTEBRATES.

This study was also conducted cooperatively between Lake Superior State University, Forestry Canada, and the Forest Service. The total cost to the Forest Service was $17,489.

Results indicated that contamination of watersheds with Btk is unlikely to directly affect aquatic insects, even at 100X the expected environmental concentrations. Toxicity testing of forest pesticides, including Bt, on non-target aquatic invertebrates.

Publications are available from David Kreutzweiser, Forestry Canada; Forest Pest Management Institute, Sault Ste. Mrie, Ontario, P6A 5M7.

NA-13 LIGNIN BINDING OF SELECTED PESTICIDES USED IN FORESTRY.

Conducted by Dr. Petr Zuman, Clarkson University. Cost to Forest Service was $104,000.

Results were not clear in the report I read. However, by telephone discussion with Dr. Zuman, all pesticides tested showed that more than 70 percent of the pesticide is irreversibly absorbed by lignin.

No publications were received but Dr. Zuman says they are in print.

CONTINUING PROJECTS:

NE-11 EFFECTS OF THREE HERBICIDES ON NONTARGET FOREST PLANTS.

A study being conducted by Dr. Ed Sucoff, University of Minnesota to measure phytotoxicity of glyphosate, hexazinone, and imazapyr on nontarget forest plants. To date, this project cost the Forest Service $35,000 and will continue into FY'93.

A Progress Report was received in August. Six sites were sprayed with hexazinone; sites sprayed in 1991 were planted with conifers. The hexazinone blocks will be planted in 1993.

NA-20 THE EFFECTS OF DIMILIN ON MOLT IN THE BLUE CRAB

This is a study being done by Dr. Steve Rebach, University of Maryland, Eastern Shore. Dr. Rebach is investigating the effects of diflubenzuron on the survival of blue crab in the Chesapeake Bay. The total cost to the Forest Service to date is $47,000. The project will be complete at the end of this fiscal year.

Results obtained from last year's study show that Dimilin, at concentrations of less than 2 ppm, causes mortality by disrupting molting. Also, preliminary indications are that when crabs are exposed during the process of molting, that mortality occurs even at the lower part per billion range.

NEW PROJECTS:

NA-24 SORPTION OF PESTICIDES IN THE FOREST SOIL & LITTER:

A study by Dr. Petr Zuman, Clarkson University. The first year of this study will cost the Forest Service $48,590.

The objectives of this study are to:

1. Develop an analytic procedure for determination of hexazinone, sulfometuron methyl, and triclopyr.

2. Study adsorption for each pesticide on natural and commercial lignin.

3. Determine the availability of pesticides that are bound to lignin.

4. Estimate amount of lignin/decomposition products in forest soil samples.

NA-25 EFFECTS OF Bt ON AQUATIC INVERTEBRATE COMMUNITIES:

A study by David Kreutzweiser, Forestry Canada; Dr. David Behmer, Lake Superior State University, and the Forest Service. First year funding is $24,940. This study is a follow up to NAPIAP Project Na-16. The purpose is to measure the effects of Bt on the aquatic microbial community as a whole. That is, the proposed whole-stream treatment will extend hazard evaluation to a community-level assessment.

AIPM PROJECTS: (Ref. Data Sheet Matrix & Gypsy Moth News Issue #29)

- More than 50 projects involving pesticides.
- Majority are directed at fate/non-targets.

OTHER ITEMS

ORGANIZATION:

Larry Yarger, R-9 Pesticide Coordinator, transferred into the Washington Office from Milwaukee, Wisconsin. Yarger's position in R-9 was filled by Russ McKinney (from the Southeastern Area/Region 8). Russ will be the contact for pesticide and related matters for Region 9.

GYPSY MOTH EIS TEAM:

EIS Team is in place. A decision has been made to write a new Environmental Impact Statement instead of supplementing the existing EIS. A Letter of Intent will be released soon.

ENVIRONMENTAL ASSESSMENTS:

Ten (10) EAs and associated FONSIs were prepared for Cooperative Gypsy Moth Suppression Projects. NA entered into a contract with Shipley Associates to produce a "Model" Environmental Assessment that can be used as a guide by other state cooperators in their respective programs. Although we now have a good working document, Shipley's participation was not satisfactory.

FOREST HEALTH PROTECTION

NA

Special & Other Projects / by FHP PROJECT NUMBER

CURRENT PROJECTS

FHP PROJ #	NA GRANT #	SHORT TITLE	PROJECT TYPE	COOP INSTITUTION	PRINCIPAL CONTACT	TOTAL FPM $$	STATUS (END DATE)	FHP CONTACT	FHP OFFICE
92-21	42-706	EFFECTS OF Bt& ON AQUATIC MICROBIALS	NAPIAP	Lake Superior State	Behmer/Kreutzweiser	$24,940	Apr-92	HATCH	AO
92-20	42-686	AERIAL SPRAY TECHNOLOGY	AIPM	Penn State U	Bill Yendol	$100,000	Mar-94	REARDON	AIPM
92-19	42-712	PHEROMONE FLAKES & BEADS IN GOSHEN, VA	AIPM	Rockbridge County Coord.	Steve Talley	$18,125	Dec-93	REARDON	AIPM
92-18	42-689	TECH TRANSFER OF INFO DEVELOPED BY AIPM	AIPM	Environ Action Found.	James Pierce	$35,000	Dec-92	REARDON	AIPM
92-17	42-688	E. malmaiga & NON-TARGET LEPS - II	AIPM	Boyce Thomp. Inst.	Ann Hajek	$13,757	Dec-92	REARDON	AIPM
92-15	42-687	E. malmaiga & NON-TARGER LEPS - I	AIPM	WV Univ	Linda Butler	$15,225	Dec-92	REARDON	AIPM
92-14	42-685	DEVELOP READY TO USE GYPCHEK	AIPM	Entotech, Inc	Pam Marrone	$0	Dec-93	REARDON	AIPM
92-13	42-684	DIMILIN- EFFECTS ON BLUE CRAB II	AIPM	U of MD - East Shore	Steve Rebach	$23,000	Dec-93	REARDON	AIPM
92-12	42-683	DIMILIN- FORESTS OF PRINCE WILLIAM CO. VA	AIPM	Geo. Mason Univ	Larry Rockwood	$20,859	Feb-93	REARDON	AIPM
92-11		SPRUCE -FIR DECL. HIGH ELEVATION STUDY	OTHER	NY ,VT, & GMNF		Oper. Acct.	ONGOING	MILLERS	DFO
92-10		VIDEOGRAPHY PILOT TEST - VT	OTHER	VT Dept of Env Cons			Jun-92	FRAMENT	DFO
92-09		BROCHURE - GM FUNGUS & VIRUS	OTHER	Boyce Thompson Inst	Ann Hajek	$2,000	Mar-92	SNYDER	DFO
92-08		RASCAL EVALUATION	OTHER	NH Div of Forests	Al Avery	$5,000	Sep-92	MILLERS	DFO
92-07		ROOT STARCH TESTING & SUGR MAPL HLTH	FOCUS	VT Dept of Forests		$1,500	Sep-92	SNYDER	DFO
92-06		SUGARBUSH SURVEY IN NY	FOCUS	NY Dept of Env. Cons.	Mike Birmingham	$860	Sep-92	SNYDER	DFO
92-05		*E. malmaiga RANGE IN NY*	FOCUS	NY Dept of Env. Cons.	Mike Birmingham	$860	Sep-92	SNYDER	DFO
92-04		HEMLOCK LOOPER - LAB PROCEDURES	FOCUS	ME For. Serv.	Henry Train	$3,400	Sep-92	SOUTO	DFO
92-03		HEMLOCK LOOPER - COMPARATIVE EVAL.	FOCUS	ME & VT Forestry	Struble & Teillon	$3,000	Sep-92	SOUTO	DFO
92-02		FOREST & SHADE TREE NEWSLETTER	FOCUS	MA Dept of Env Mgt	Jim MacArthur	$6,000	Sep-92	SNYDER	DFO
92-01	42-710	SORPTION OF LIGNIN	NAPIAP	Clarkson	Petr Zuman	$48,590	May-94	HATCH	AO
91-18	42-618	DIMILIN- EFFECTS ON AQUATIC FUNGI	AIPM		John Landolt	$27,500	Jan-92	REARDON	AIPM
91-17	42-634	AERIAL APPL WITH MICROBIALS	AIPM	Penn State U	Bill Yendol	$75,000	Dec-92	REARDON	AIPM
91-16	42-633	DIMILIN & HYPOMYCETES	AIPM	U of Pitt	Ken Cummins	$29,350	Dec-92	REARDON	AIPM
91-15	42-627	DIMILIN & CLOSED WATERSHEDS	AIPM	NC St. U.	James Harper	$20,000	Apr-92	REARDON	AIPM
91-14	42-633	*NPV & E. malmaiga COMPETITION*	AIPM	U of Mass	J. Elkinton	$28,645	Sep-92	REARDON	AIPM
91-13	42-646	DIMILIN & FOREST POLLINATORS	AIPM	Georgetown Univ	Ed Barrows	$46,480	Mar-93	REARDON	AIPM
91-12	42-643	POPUL. MONITRING/ ANALYSIS & REPRTS	AIPM	Penn State U	Shelby Fleischer	$17,000	Apr-92	REARDON	AIPM
91-11	42-639	MONITORING OF NON-TARGET ORGAN.	AIPM	Environ. Action Found.	James Pierce	$50,918	Dec-92	REARDON	AIPM
91-10	42-660	Bt & EFFECTS ON NON-TARGET Lepe	AIPM	Wash. & Lee Univ	Cleve Hickman	$21,620	Sep-92	REARDON	AIPM
91-08		AIR RESOURCE MGMT ASSIST	OTHER	R9,NPS,U MN	Thomas/ Parrott	$2,500	ONGOING	MIELKE	SPFO
91-07		HAZARD TREE MANUAL	FOCUS	MN DNR		$7,000	Jun-92	MIELKE	SPFO
91-05		FOREST CANOPY HEALTH - VT	FOCUS	VT Dept of Forests	Brent Teillon	$28,000	Sep-92	SOUTO	DFO
91-04		AERIAL SKETCH MAPPING SURVEY	FOCUS	VT		$4,250	Sep-91	SOUTO	DFO
91-03	42-632	DIMILIN & MOLT IN THE BLUE CRAB	NAPIAP	Univ. of MD ES	Steve Rebach	$51,000	Sep-92	HATCH	AO
91-02	42-628	ASSESSMENT OF GARLON-4	NAPIAP	Lake Superior State	Behmer/Kreutzweiser	$21,870	Apr-92	HATCH	AO
91-01	42-647	EFFECTS OF THREE HERBICIDES	NAPIAP	Univ of MN	Ed Sucoff	$16,000	Sep-92	HATCH	AO
90-69	42-623	GM MGT/ NUCLEOPLY.... VIRUS	AIPM	Canada	John Cunningham	$95,890	Dec-92	REARDON	AIPM
90-68	42-622	NORTH AMER MAPLE PROJECT (NAMP)	SPECIAL	Canada/US		$306,000	ONGOING	MILLERS	DFO
90-67		SPRUCE FIR DECLINE SURVEYS	SPECIAL	FHP & For. Resp. Prog.		$533,000	Sep-92	M-WEEKS	DFO
90-65		HEMLOCK LOOPER - ME, VT, MA	FOCUS	ME For. Serv.	Henry Trial	$34,000	Sep-92	SOUTO	DFO
90-62		VT HARDWOOD RESURVEY	OTHER	VT & GMNF		$30,000	Jun-92	COX	DFO
90-57		GYPSY MOTH FOCI	FOCUS	VT	Bill Yendol	$67,500	Sep-91	SOUTO	DFO
90-56	42-603	DIMILIN/SPRAY ACCOUNT	AIPM/NAPIAP	Penn State U	Bill Yendol	$80,000	Dec-92	REARDON	AIPM
90-54	42-568	RED SPRUCE MORTALITY IN WV	OTHER	WV Univ	Craig Hollingswrth	$24,000	Sep-91	JACKSON	MFO
90-53		PEAR THRIPS POPULATION EVAL	OTHER	U of NH	Bob Chianese		ONGOING	ACCIAVATTI	MFO
90-52		HEMLOCK WOOLLEY ADELGID/NJ	FOCUS	NJ DNR		$19,000	Oct-91	SCHNBRGR	MFO
90-51		DOGWOOD ANTHRACNOSE SURVEY	FOCUS	MNF/STATES		$30,000	Dec-92	JACKSON	MFO
90-50		BEECH BARK DISEASE	OTHER	R9			ONGOING	JACKSON	MFO
90-48		TREATMENT MONITOR DATABASE	OTHER	NA Sts & NF	Parrott/Berrang		ONGOING	TWARDUS	MFO
90-47		WILDERNESS AREAS/ AIR QUAL	OTHER	R9,R8,NE	Marshall/Ehlers		ONGOING	JACKSON	MFO
90-46		ASH DECLINE SURVEY	FOCUS	IN & OH	Gregory Elmes	$10,000	Sep-91	JACKSON	MFO
90-45	42-528	GIS DEVELOPMENT/AIPM	AIPM	WV Univ	Gregory Elmes	$123,116	Sep-92	REARDON	AIPM
90-44	42-596	DEMONSTRATION SITES/AIPM	AIPM	Jeffrsn NF	Hedrick/MacFarind	$236,000	Sep-92	REARDON	AIPM
90-43	42-515	DATA ACQUISTION SYSTEM	AIPM	VPI & SU	William Ravlin	$220,140	Feb-93	REARDON	AIPM
90-42	42-522	DATA BASE MGNT SYSTEM	AIPM	VPI & SU	William Ravlin	$227,972	Feb-93	REARDON	AIPM
90-41	42-523	GM AIPM PACKAGE	AIPM	VPI & SU	William Ravlin	$138,784	Feb-93	REARDON	AIPM
90-39	42-532	FORMULATIONS & AGDISP EVAL	AIPM	Penn State U	Bill Yendol	$54,525	Dec-91	REARDON	AIPM
90-38	42-533	SWATH KIT DATA BASE	AIPM	Penn State U	Bill Yendol	$25,138	Sep-90	REARDON	AIPM
90-37	42-536	TRAINING/AIPM CARTOGRAPHER	AIPM	WV U	Gregory Elmes	$28,251	Sep-92	DeLOST	AIPM
90-36	42-506	*E. malmaiga PARTII*	AIPM	U OF MA	Joe Elkinton	$35,420	Sep-92	REARDON	AIPM
90-35	42-507	*E. malmaiga - IN SOUTHERN APPALACHIANS*	AIPM	Boyce Thmpsn Inst	Ann Hajek	$73,729	Sep-92	REARDON	AIPM
90-34	42-594	Bt LEPIDOP & Non- TARGETS LEPS/BATS	NAPIAP	WV Univ	Robert Whitmore	$227,000	Mar-93	REARDON	AIPM
90-33	42-592	DIMILIN - RESIDUE ANALYSIS	AIPM	WV Univ	Mary Wimmer	$138,350	Dec-93	REARDON	AIPM
90-32	42-591	GM DEFOLIATION & ITS IMPACT ON TROUT	AIPM	James Madsn U	Daniel Downey	$54,645	Dec-92	REARDON	AIPM
90-31	42-590	DIMILIN - SOIL MICRO-ORGANISMS	AIPM	WV Univ	Alan Sexstone	$5,000	Sep-90	REARDON	AIPM
90-30	42-586	DIMILIN STUDIES - AQUATIC MACRO-INVERT	AIPM	WV Univ	Sue Perry	$61,340	Mar-93	REARDON	AIPM
90-29	42-585	DIMILIN - LEAF LITTER ARTHROPODS	AIPM	WV Univ	Sue Perry	$105,595	Dec-92	REARDON	AIPM
90-28	42-584	DIMILIN/FLD MONT. AQUAT MACRO-INVERT.	AIPM	WV Univ	Sue Perry	$124,976	Jan-93	REARDON	AIPM
90-27	42-583	DEPOSITS IN DECIDIOUS CANOPIES	AIPM	Penn State U	Bill Yendol	$31,307	Dec-91	REARDON	AIPM
90-26	42-582	Bt - CANOPY ARTHRO/BIG-EARED BATS	NAPIAP	WV U	Linda Butler	$71,394	Dec-92	REARDON	AIPM
90-25	42-581	DIMILIN - SOIL MICROFLORA	AIPM	Shepherd	John Landolt	$24,250	Dec-92	REARDON	AIPM
90-24	42-580	DIMILIN/CANOPY ARTHROPODS	AIPM	WV U	David Miller	$44,550	Dec-91	REARDON	AIPM
90-23	42-579	FSCBG MODEL EVALUATION	AIPM	U of CT	Bill Yendol	$90,800	Dec-92	REARDON	AIPM
90-22	42-573	NEFAAT - TECHNICAL ASSISTANCE	AIPM	Penn State U	Jack Baniecki	$16,499	Aug-91	REARDON	AIPM
90-21	42-572	AIPM PUBLIC INVOLV EMENT IN WV	AIPM	WV U	Joe Elkinton	$138,571	Dec-92	FREY	AIPM
90-20	42-570	GYPCHEK - NEW ASSAY FOR VIRUS MORTALITY	AIPM	U of MA	Joe Elkinton	$81,384	Apr-92	REARDON	AIPM
90-19	42-566	F1 STERIL GM EGGS	AIPM	U of MA	Dr. Bill Perry	$25,920	Apr-90	REARDON	AIPM
90-18	42-546	DIMILIN - LEAF LITTER ARTHROPODS	AIPM	WV Univ	Tom Pauley	$33,544	Feb-90	REARDON	MFO
90-17	42-545	DIMILIN - TERRESTRIAL SALAMANDERS	AIPM	Marshall	Tom Pauley	$60,008	Dec-93	REARDON	MFO
90-16	42-544	DIMILIN - STREAM SALAMANDERS	AIPM	Marshall	States, MAG, NFS,	$54,920	Dec-93	REARDON	AIPM
90-15		JPBDSS (TDP #36)	TDP	INTERNAT'L	Roger Hoffer	$176,000	Sep-93	CONNOR	SPFO
90-13		SEED & CONE/PHERMONE MONITOR (TDP #33)	TDP	WI DNR	Sean Ahearn	$30,000	Oct-91	KATOVICH	SPFO
90-11		FOREST TENT CAT ASSESSMENT	FOCUS	MN DNR	Al Jones	$14,000	Sep-91	CONNOR	SPFO

NORTH CENTRAL STATION

NATIONAL PESITICIDE USE COORDINATORS MEETING 9/29-10/1/92

North Central Forest Experiment Station Activities Report

Dan Netzer

Recent pesticide research at the North Central Station has centered on biotechnology to develop resistance to and control of forest pests. Projects at Rhinelander, Wisconsin; East Lansing, Michigan; and St. Paul, Minnesota; are working on several different approaches to management of deseases, insects, and competing vegetation.

Through research funded by the Department of energy's Woody Biomass Program, RWU 4155 at Rhinelander has identified 8 hybrid poplar clones with increased tolerance to herbicides. The trees were produced using genetic modification techniques of in vitro selection and gene insertion. Genetically engineered trees have been tested in greenhouse trials and found to have increased tolerance to Roundup (although not commercially-important) and no loss of productivity traits. In vitro selected trees were found to have commercially important tolerance to Oust (sulfometuron methyl) and Roundup (glyphosate) following greenhouse and preliminary field tests. Some in vitro selected trees had reduced height compared to parent clones that they were derived from, but had increased branching. It is unknown whether this will result in reduction in total tree biomass. Herbicide tolerance has been achieved through alteration of enzyme activity that is normally inhibited following application of the herbicides. Some trees appear to have increased (normally herbicide-sensitive) enzyme activity and others appear to have altered enzymes that are no longer inhibited by the herbicides. Elite in vitro selected clones will be planted in breeding arboretums to allow future evaluation of gene transmission into other commercially important clones.

Research by RWU 4101 also funded by the Department Energy on the use of Roundup (glyphosate) for weed control during the growing season in hybrid poplar plantations is being published. Results indicate that Roundup applied during April or May in three-year-old and younger hybrid poplar plantations usually results in tree growth increases and that later summer applications often result in tree damage, growth loss, or morality. Application in 4-year-old and older plantations may be made throughout the growing season unless there if they do not have actively growing crowns in the spray zone.

Insect pathology research by RWU 4501 in East Lansing includes research projects of both endemic and exotic entomopathogens of forest insect pests. The objectives of these ongoing studies are to: 1) determine the toxicity of various Bacillus thuringiensis (Bt) isolates in coleopterans, including the cottonwood leaf beetle, Chrysomela scripta and the imported willow leaf beetle, Plagiodera versicolora. Related research includes field trials with formulated

Bt-based insecticides, determining the impact of Bt on chrysomelids and physiological interactions, selection of a cottonwood leaf beetle population with resistance to Bt toxin, and determining the mechanisms of resistance of both the cottonwood leaf beetle and the Colorado potato beetle (Leptinotarsa decemlineata) selected against the Bt CryIIIA toxin.
2) quantify the interactions between nuclear polyhedrosis virus (NPV) and two species of European microsporidia (Nosema portugal and Vairimorpha lymantriae) infecting gypsy moth, Lymantria dispar. In addition, epizootiological studies of N. portugal began in 1992 in three Michigan woodlots (<10 acres). The results of these studies will improve our understanding of the impact microsporidia will have as biological control agents of gypsy moths in North America.
3) determine the incidence of Entomophaga maimaiga, a fungal pathogen of gypsy moth, Lymantria dispar, in Michigan, and determine the optimal fungal release method. This study began in 1991 and will continue to monitor establishment and determine rate of spread from epicenters in relation to weather conditions.
4) describe a newly discovered species of microsporidium (Nosema scripta) from the cottonwood leaf beetle, Chrysomela scripta, and determine the role this pathogen may play in the population dynamics of its host. Additional studies are ongoing to the geographical extent of this pathogen in field populations of cottonwood leaf beetle and seasonal distribution.
5) determine the potential impact of gypsy moth sprays (Bt) on the Karner blue butterfly, Lycaeides melissa samuelis, using laboratory bioassays and field evaluations.

Work by RWU 4502 in St. Paul is investigating the possibility of inducing Septoria resistance in hybrid poplar using somaclonal selection. Hybrid poplar clone NE-308 has been established in tissue culture. Various media formulations have been used to maximize callus production, adventitious bud induction, shoot proliferation, and rooting of this clone. Our experience has shown that poplar clones do not all respond to the same culture conditions and NE-308 has been more recalcitrant than some of the other clones that have been worked with in the past. Several hundred shoot cultures from various tissue sources are now established in the laboratory and will soon be rooted in the growth room. plants obtained from shoot cultures are continuously being rooted and acclimated to greenhouse conditions. We have several rooted plants in the greenhouse ready to be tested for resistance using our in vitro bioassay.

It is likely that pesticide applications in the Lake States National Forests will continue to be restricted. Future research at the North Central Station will most likely emphasize biological alternatives to chemical pesticides.

PACIFIC NORTHWEST STATION

Pesticide Coordinator's Report
Pacific Northwest Research Station
September 1992

The following is a synopsis of the pesticide related activities that have occurred at the PNW Research Station since February 1990. While many cooperators or sources of funding are involved, for purposes of communications the senior PNW scientist involved is listed.

Roy C. Beckwith; Corvallis, OR

1. Testing of the tussock moth biocontrol virus.

As requested by FPM, the TM BioControl-1 virus was tested against the Douglas-fir tussock moth on the Boise National Forest in 1991 in cooperation with FPM, Region 4. The objective was to determine the effect of different dosages on the insect under field conditions; population densities were generally high throughout the area. Applications were as follows: (1) standard dosage as labelled; (2) .5 dosage; and, (3) none (control plots). Five replicates of 16 hectares each were used for each dosage (total of 15 16-ha plots). A small amount of natural virus was present in a few of the plots. Results were variable and are in the process of final analyses. Postspray larval sampling showed higher counts than anticipated. Postspray soil samples taken in 1991 and 1992 showed an increase in virus activity. Laboratory bioassays are being conducted to determine apparent differences in the LD_{50} of the NPV against the Goose Lake strain and two different field populations.

Gary Daterman; Corvallis, OR

1. Pheromone research on Douglas-fir beetle.

We are currently testing the ability of ground applied methycyclohexenone (MCH) to deter/repel beetles from infesting high-value stands such as riparian zones or designated old-growth. The work is being conducted in eastern Oregon. Initial results look very good. Stand protection appears to have been achieved.

Another study employs trapping with aggregation pheromones over section-size areas, with before and after evaluations of incidence of attacked trees in the area. This will require at least 2 more years to fully evaluate but the initial results look good. It is proposed to link this approach with the sanitation salvage of infested trees that is already being conducted.

David G. Grimble; Corvallis, OR

1. Impacts of Bacillus thuringiensis on nontarget lepidoptera in western coniferous forests. Three-year NAPIAP funded project initiated in 1992.

During the first year (1992) of this three year effort, plots were established on the Umatilla and Wallowa-Whitman National Forests, ULV blacklight traps were operated in the plots all summer to collect adult lepidoptera. Additionally, major tree and shrub species were sampled for immature lepidoptera. Following this season of gathering background data, half of the plots will be sprayed

with Bt in 1993, to estimate the effects of Bt on resident nontarget lepidoptera species. Subsequent sampling and light trap collections in 1993 and 1994 will reveal which lepidoptera species were most impacted by the sprays, the relative severity of those impacts, and the rapidity of species recovery following treatment. So far we have recorded over 250 species of lepidoptera resident on the plots, several of which had not previously been recorded from Oregon.

Lonnie L. Sower; Corvallis, OR

1. Cooperative Pilot Test Using Synthetic Pheromone to Disrupt Mating of Douglas-fir Tussock Moth, Orgyia pseudotsugata. A FPM Technology Development Project. (R4).

Six, 200-acre plots were established in the Hitt mountains, Weiser RD, Payette National Forest. No-Mate® DFTM pheromone loaded in center sealed fibers and mixed with a sticker was applied via helicopter to 3 plots in August, 1991 at 10g AI /acre. Treatment reduced the next years larvae population by about 81% in treated vs check plots. Results are statistically significant and consistent with those of previous tests. Treatment had no measurable effect on carpenter ants (Camponotus spp.), western spruce budworms (Choristoneura occidentalis), or spiders. In sum, mating disruption treatment has substantial impact on Douglas-fir tussock moth populations and is unlikely to effect non-traget arthropods.

2. Distribution of MCH and similar behavioral chemicals in the field after release from artificial sources.

MCH (3,2-methylcyclohexen-1-one) and verbenone are behavioral chemicals which repel several species of bark beetles. We plan to determine the release patterns of MCH, verbenone, and similar materials and determine how they are transported and dispersed in air in the forest. The purpose is to determine whether currently used formulations are efficient. Preliminary results indicate that vertical dispersion, to 50% of the concentration on level with the release, is fairly rapid in moderate wind. A vertical movement of 1 unit occurs with 3 to 5 units of drift down wind of the release point. This estimate is consistent with previous behavioral data obtained with moths in a forested area.

3. Mating disruption of Western pine shoot borer in lodgepole pine.

Pheromone mating disruption was tested against western pine shoot borer, Eucosma sonomana Kearfott on young lodgepole pines, Pinus contorta Douglas. About 12.5 g of pheromone per ha were applied in Hercon luretape (TM) at about 2 m high to five 6 ha plots each year for 3 years. Incidences of shoot borer larvae in terminal shoots were reduced from 77% infested in untreated checks to 48% in treated plots. This degree of efficacy, while statistically significant, was insufficient to cause measurably better tree gowth in the treated plots. Efficacy was substantialy lower than previously demonstrated in ponderosa pine, Pinus ponderosa Douglas ex Laws. Terminals of trees located near the treated plot centers were less likely to be infested than those near the edge. This suggests treatment of a larger area may improve control at sites contiguous with additional pine shoot borer habitat.

4. Aerial application of 3-methyl-2-cyclohexen-1-one (MCH) to prevent damage by Douglas-fir beetle to standing green Douglas-fir in interior forests. (R1, R4, R6, PNW)

Previous tests indicated beetle attacks were reduced >95% in downed trees by and others by MCH formulated in polyamide beads (McGregor and others). Furniss reported varying degrees of efficacy depending on dose and spacing of various releasers. MCH (Methyl cyclohexanone), in plastic beads, will be applied by Helicopter in a controlled release formulation manufactured by Pherotech Inc. The formulation is be similar to the granular formulation of 2% MCH in polyamide beads which is suitable for air application in standard fertilizer equipment. The Forest Service currently holds an experimental use permit for such an application in the NW US.

Walter G. Thies; Corvallis, OR

1. Application of fumigants to trees or stumps to control laminated root rot.

Laminated root rot is a major root disease problem in the West. Several fumigants have been found effective in reducing or completely eradicating the pathogen from infested stumps and roots. A study was initiated to evaluate the effectiveness of injecting live Douglas-fir with chloropicrin or methylisothiocyanate to control laminated root rot, and the impact of the treatment on the trees. Of the 120 trees treated in the spring of 1982, 88 were still living when the study was terminated in the fall of 1991, the trees felled and their roots examined. All field and lab work has been completed and data is being analyzed.

A second related study was established in 1988 to evaluate the cost and degree of reduction in the reappearance of laminated root rot in a replacement stand using chloropicrin for stump fumigation. Stumps were treated by pouring chloropicrin into holes drilled into the stump tops and then sealing the holes. Douglas-fir seedlings were planted back onto the site and are now being monitored for growth and disease development. We do not anticipate initiating additional studies involving fumigants.

A unique study was initiated in 1988, with NAPIAP support, to determine the bioresponse of nontarget organisms when chloropicrin is used to control laminated root rot. The bioresponse study took advantage of plots and treated stumps in the second study by monitoring treated areas and quantifying the changes in four segments of the ecosystem likely to be sensitive to chloropicrin: vascular plant community, detrital foodweb, soil microarthropods, and mycorrhizae formation. Due to the anticipated slow release of chloropicrin from the stumps, monitoring continued for three years. Although analysis is not complete some results are available: 1. The monitoring techniques employed work. It is possible to consistently detect small population changes. 2. Chloropicrin does have a small but measurable effect on the non-target organisms examined. 3. There is still a question of scale of change and the meaning of the species shifts detected. 4. The changes have increased over the three years of the sampling and we cannot speculate on the end point of the change. We believe that on a stand or ecosystem level that the impact is negligible. Funds are being sought to monitor the study site during the fifth season to determine if the population shifts have continued.

In a separate but similar study, the effects on biodiversity of fumigants used to control laminated root rot of Douglas-fir was examined ten years after

treatment. Prior to harvesting the above mentioned fumigated-live-tree study in the fall of 1991, observations were made on the vascular plant community and soil samples were collected to allow the evaluation of the detrital foodweb and soil microarthropods. The field and lab work are complete, but some analysis remains. Examination of the data for the vascular plant community indicates that 10 years after treatment the plant cover around treated trees has been reduced but the species richness has increased.

Richard A. (Skeeter) Werner; Fairbanks, AK (Note there will be some overlap here with work reported by Ed Holsten.

NAPIAP Funded Research

NAPIAP funded research conducted by PNW (Fairbanks) is in cooperation with: (1) FPM (R10) and Oregon State University on the comparative dissipation of forest herbicide residues in stands of white spruce in interior and in Sitka spruce in south-central Alaska and includes determination of the rates of dissipation for 2,4-D, triclopyr, glyphosate, hexazinone, and imazapyr on soils and vegetation; estimation of the mobility of hexazinone and triclopyr in soils on high rainfall coastal forest sites; and development of models of herbicide persistence based on soil temperature, water content and leaching applicable for Alaska; and (2) FPM (R10) and North Carolina State University on persistence as the cause of differential efficacy of carbary on the bark of loblolly pine in North Carolina and spruce in Alaska and includes the development of HPLC methods to measure carbaryl residues on tree bark, comparison of the rates of penetration and metabolism on the host species and on the exoskeletons of the beetles, determination of the effects of temperature, relative humidity, and bark penetrability using the new HPLC methods on the degradation of carbaryl and its metabolites on bark of the host trees.

Other Research

The following cooperative research is underway by PNW in Fairbanks: (1) PNW, FPM (R10), and North Carolina State University on the biochemical, behavioral, and meteorological factors associated with carbaryl selectivity toward western bark beetles; (2) PNW, FPM (R10), and Oregon State University on the rehabilitation and competition studies on deforested land in interior and south-central Alaska; and (3) PNW and FPM (R10) on the development of operational strategies for monitoring and manipulating spruce beetle populations using semiochemicals in traps and on baited trees in interior and south-central Alaska. These host and insect-produced aggregation and antiaggregation chemicals include alpha pinene, limonene, myrcene, ethanol, frontalin, ipsenol, ipsdienol, methyl butenol, exo-brevicomin, verbenone, verbenol, 1-methylcyclohex-2-enol (MCOL), 3-methylcyclohex-2-enol (seudenol), and 3-methylcyclohex-2-enone (MCH).

Pesticide Coordinator's Report
Pacific Northwest Research Station
September 1992

Issues Needs and Concerns

1. There is a need for studies on impacts of BT insecticides on non-target organisms in the west.

2. There is a need for field tests of tussock moth virus (TM BioControl-1 to evaluate formulation, carriers, dosages, volumes etc.

3. The tussock moth virus production unit is in questionable status for continuation. Some options for its continued viability depend upon PNW technical support.

Note: Items 1-3 are raised at this point because the team that has handled 1 & 2 at the PNW and has provided technical support for 3 is being eliminated.

4. An important need related to the pheromones is that FS/EPA need to secure registration of the successful pheromones already identified and demonstrated for control. This includes tussock moth pheromone (control by mating disruption), methylcyclohexenone (MCH) for Douglas-fir beetle and spruce beetle, verbenone for mountain pine beetle, southern pine beetle, and possibly other beetle spp., other bark beetle pheromones, and possibly other pheromones that have been adequately developed to the appropriate stage. Note: John Taylor is leading a group to accelerate this activity, so perhaps this need is now well in hand.

5. Concern that the definition of a pheromone as an insecticide unnecessarily restricts research on these potentially important tools. It would be useful if the experimental use permits could be for a larger area.

6. A concern that there may be a loss of registration of some insecticides used for seed and cone insects. This is a small volume use but their loss will reduce control options.

ROCKY MOUNTAIN STATION

PESTICIDE COORDINATOR'S REPORT

Rocky Mountain Forest and Range Experiment Station

Prepared by Karen M. Clancy, Research Entomologist,
RM Pesticide Use Coordinator, September 28, 1992

Pesticide related research by scientists at the Rocky Mountain Station between February 1990 and September 1992 has been limited to work with mountain pine beetle pheromones by Dr. John Schmid (Research Entomologist with RM-4151) and a pilot study using Velpar-L to kill dwarf mistletoe on pine by Dr. Brian Geils (Research Plant Pathologist with RM-4501). All other pesticide activities at the RM Station have been related to the control, monitoring, or manipulation of damage to plants used in greenhouse or field experiments from insects, diseases, rodents, or weeds. In other words, the Rocky Mountain Station is doing very little work in regard to developing or implementing new technology and approaches for using pesticides in forest and range management. Thus, I cannot identify any issues, needs, problems, challenges, or opportunities related to research on pesticides at the Rocky Mountain Station.

Dr. John Schmid used a three active ingredient pheromone formulation on 21 tree groups in a mountain pine beetle research project in FY 1990. In FY 1991 he used pheromone formulations with three and one active ingredients, which were tested on 2 and 10 trees, respectively. Dr. Schmid did not conduct any pheromone related research in FY 1992, but he did use mountain pine beetle tree baits in conjunction with a tree-watering study to attract beetles onto the watered and unwatered trees.

In FY 1992, Dr. Brian Geils participated in a pilot study using DuPont Velpar-L (a water dispersible liquid of 25% hexazinone) to kill dwarf mistletoe (*Arceuthobium* spp.) on pine (*Pinus* spp.). This study was initiated by Dr. Roger Webb at the University of Florida. The herbicide was delivered directly into the base of 40 trees on 30 June 1992, using microinjection capsules provided by ArboR$_x$® Tree Technology Systems; one capsule was used per 4 inches of circumference. Three dosage levels were tested (0.125, 0.250, and 0.500 ml Velpar in 5 ml water). When the trees were examined on 26 July and 29 August, most of the trees had from few to many branches that had been killed recently, but none of the trees were completely dead. Although the pine needles on the dead branches had been killed or stunted by the herbicide, the mistletoe shoots remained largely unaffected. There was no apparent association of dead branches with mistletoe shoots or brooms. Dr. Geils concluded that although the ArboR$_x$® capsules were clean and easy to use, the systemic injection of Velpar did not show any promise for selective killing of dwarf mistletoe shoots. He recommended that additional research for chemical control of mistletoe should focus on basic physiological studies on transport and metabolism in order to find an herbicide that disperses well within the tree, and has a selective, detrimental effect on the mistletoe parasite.

SOUTHEASTERN STATION

[illegible]

PESTICIDE COORDINATOR'S REPORT

Southeastern Forest Experiment Station

(February 1990 to September 1992)

by

John C. Nord, Acting

Overview of Station Program

Research on conventional pesticides and on alternative control and/or preventative measures for insects and diseases is carried on in 3 projects within the Southeastern Station. These are the Diseases of Southern Forests Project and The Biology, Ecology, and Management of Cone and Seed Insects of Southern Forests Project (both located in Athens, Ga.) and the Integrated Pest Management in the Slash and Longleaf Pine Ecosystem Project located in Olustee, FL. Research on environmental fate of herbicides, impact of herbicides on wildlife habitat and vegetative biodiversity and the use of herbicides to restore longleaf pine-wiregrass ecosystems and open longleaf savannahs is carried on in the Intensive Forest Management Practices Assessment Center in Gainesville, FL. The evaluation of herbicides as treatments in silviculture studies is carried on in the Ecology and Management of Forested Wetlands Project, in Charleston, SC and the Silviculture and Management of Pine-Hardwood Mixtures in the Piedmont Project at Clemson, SC.

Specific Studies by Project

Diseases of Southern Forests (SE4502), Athens, Ga.

1) Test of fungicides to control dogwood anthracnose. F.T. Smith (SE) and Kerry Britton (SE).

Objective: to screen fungicides for control of the disease.

2) Test of schedules for the application of protectant fungicides to control dogwood anthracnose. Kerry Britton (SE).

Objective: to determine if the present fungicide recommendation for full-season protectant sprays can be reduced by omitting either early or late-season applications.

3) Use of heating wood chips with steam or radio waves to kill pine wood nematode. L. David Dwinnell (SE) cooperating with the Georgia Power Co. and Georgia Tech.

4) Several aspects of genetic control of dogwood anthracnose. K. Britton (SE).

5) Several aspects of genetic control of fusiform rust in loblolly and slash pine. George Kuhlman (SE).

6) Relation of Nantucket pine tip moth attack and fusiform rust infection in loblolly pine families. R.L. Hedden (Clemson U.), Roger P. Belanger (SE, Ret.), Harry R. Powers (SE, Ret.) and Thomas Miller (SE Ret.). Published South. J. Appl. For. 15: 204-208.

7) Management strategies to reduce losses from fusiform rust. H.R. Powers (SE, Ret.), T. Miller, (SE, Ret.), and R.L. Belanger (SE, Ret.). To be published in the fall of 1992 in the South. J. Appl. For.

8) Loblolly pine seed sources differ in susceptibility to the southern pine beetle in South Carolina. H.R. Powers (SE, Ret.), R.P. Belanger (SE, Ret.), and W.D. Pepper (SE). Study to be published in the fall of 1992 in the South. J. Appl. For.

Biology, Ecology, and Management of Cone and Seed Insects of Southern Forest Trees (SE4501), Athens, Ga.

1) A test of the efficacy of bifenthrin for cone and seed insect control in southern pine seed orchards. Cooperative study sponsored by the Seed Orchard Pest Management Committee, subcommittee of the S. Forest Tree Improvement Conference. G.L. DeBarr and J.C. Nord (SE), L.R. Barber, A. Mangini, J.W. Taylor (FPM, R.8), R.S. Cameron (Tex. For. Serv.), cooperating with members of the three Southern Forest Tree Improvement Coops.

Objective: evaluate the efficacy of bifenthrin applied monthly at .1 to .2 lb (a.i.)/ac/spray to control seed bugs and coneworms in loblolly and slash pine seed orchards.

2) Guthion rate test for cone and seed insect control in loblolly pine seed orchards. Seed Orchard Pest Management Committee. (Same investigators and cooperators as in 1. above)

Objectives: To compare 4 lower [1 to 2 1/2 lb (a.i.)/ac/spray] rates of Guthion with the recommended aerial rate, 3 lbs (a.i.)/ac/spray.

3) A special project to demonstrate and evaluate control of the webbing coneworm, Dioryctria disclusa, by mating disruption. G.L. DeBarr, J.C. Nord (SE), Chris Niwa (PNW), L.R. Barber, A. Mangini, FPM-R8. To be completed in 1993.

Objective: To demonstrate that permeation of an orchard with pheromone for the purpose of mating disruption of D. disclusa will protect loblolly pine cone crops.

4) Development of degree-day (DD) models for leaffooted (Leptoglossus corculus) and shieldbacked (Tetyra bipunctata) pine seed bugs in southern pine seed orchards. J.C. Nord, G.L. DeBarr and M.W. McGuinness (SE).

Objective: to develop DD models to predict when certain life stages of L. corculus and T. bipunctata occur in the field, using local current accumulated heating degree-days.. The models will be used to time insecticide sprays and population sampling and to predict the number of generations (L. corculus) in the local seed orchard.

Integrated Pest Management in the Slash and Longleaf Pine Ecosystem (SE4552), Olustee, FL.

1) Insecticides for control of nursery and plantation insects. John L. Foltz (U. FL), Carl W. Fatzinger (SE), Wayne N. Dixon (FL Div. For.) and IPM Cooperative members.

Objective: to determine the efficacy of BAY NTN 33893 as a seed soak and as a granular application to seedlings for reducing infestation levels of nursery insects, pine tip moths, and other insects and increasing tree growth over the period of several tip moth generations.

2) Best management practices for control of fusiform rust on pine in the South. Bob Schmidt (U.FL), Roger Belanger (SE, Ret.), Thomas Miller (SE, Ret.)

Objective: To evaluate best management for fusiform rust control: Oak control/no oak control; species selection, ie. loblolly or slash; rust resistant/rust susceptible seedlings; fertilizer, weed control, and Bayleton(R) application twice yearly for first 3 growing seasons. Southwide, long term.

3) Guidelines for southern pine beetle (SPB) control in pine plantations. R.P. Belanger (SE, Ret.) and Roy Hedden (Clemson U.).

Objective: To prevent SPB damage in plantations using silvicultural practices such as species selection, thinnings, genetic resistance and risk ratings.

4) Developing visual crown characteristics assessment related to forest health monitoring. R.P. Belanger (SE, Ret.) and Robert Anderson (FPM R8).

5) Management strategies to reduce losses from the southern pine beetle. R.P. Belanger (SE, Ret.), R.L. Hedden (Clemson U.), and P.L. Lorio, Jr. (SO-Pineville, La). To be published fall 1992 in the South. J. Appl. For.

Intensive forest Management Practices Assessment Center (SE4106), Gainesville, FL

1) Environmental fate of hexazinone, imazapyr, triclopyr, and picloram on the Savannah River Plant. P.B. Bush (U GA), D.G. Neary (SE), J.W. Taylor (FPM R8).

Objective: provide soil and water monitoring data sets for herbicides used in site preparation on the SRP.

2) Impact of forestry herbicides in the southern Coastal Plain on wildlife habitat and vegetative biodiversity. K.V. Miller (U GA), P.B. Bush (U GA), D.G. Neary (SE), and J.W. Taylor (FPM-R8).

Objective: Assess the impacts of site preparation herbicides on wildlife habitat and plant diversity.

3) Use of hexazinone for understory release of a successionally advanced xeric sandhill. R. Mulholland (FL Dept. Nat. Resources), R.N. Wilkins (Port Blakeley Co., Olympia WA), D.G. Neary (SE).

Objectives: Determine hexazinone rates necessary for release of understory herbaceous vegetation characteristic of open longleaf pine savannahs.

4) Restoration of longleaf pine-wiregrass ecosystems using low-rate herbicide applications. K.W. Outcalt (SE), D. Brockway (Arapahoe-Roosevelt N.F., Fort. Collins, CO.).

Objective: Evaluate the effect of hexazinone on plant species and its effectiveness for restoring longleaf-wiregrass sites.

Silviculture and Management of Pine-Hardwood mixtures in the Piedmont (SE4105), Clemson, SC.

1) Pine-hardwood regeneration in small openings for uneven-aged management. Thomas Waldrop (SE).

Objective: to convert a Piedmont hardwood stand to an uneven-aged pine-hardwood mixture by introducing pines in small openings. Herbicide, Garlon 3A(R), applied at full strength to hardwood stumps to prevent sprouting.

Ecology and Management of Forested Wetland Ecosystems of the South Atlantic Coastal Plain (SE4103), Charleston, SC.

1) Stand dynamics under four methods of restoring an 85-acre bottomland hardwood stand. Marilyn A. Buford (SE), and Donal Hook (Clemson U.).

Objective: to compare the efficacy of a series of silvicultural treatments in restoring the function and value of a damaged (by Hurricane Hugo) bottomland hardwood stand: a) no treatment; b) cut all stems >1" dbh; c) cut all stems >1" dbh and spray all stumps except red oaks with Accord(R) to retard sprouting; and d) cut all stems >1" dbh, spray all stumps except red oaks with Accord, and plant cherrybark oaks at a density of 1210 stems/ac.

Needs

1) Continuation of FS and EPA policy not to require GLP for efficacy testing, which is not part of an EPA registration package. We can't afford it (see 3. below).

2) Eliminate need for experimental use permits for pheromone studies or help in expediting granting EUP's in a reasonable time.

3) Need budget increase -- our project '92 budget was 31% below that for FY91 and our '93 budget is projected at 42% below FY91's. This does not account for inflation.

4) FIDR projects need more support for pesticide related research, verbally and monetarily, at the WO and Station levels. To be sure we need to develop alternative methods not involving hard pesticides, but developing this technology will take time. Our clients need better tools today, and the greatest gain in efficacy of pesticides and reducing the pesticide load on the environment, in the short term, lies in registering less toxic and less enviornmentally insulting pesticides, reducing rates, reducing the number of sprays, in better timing of sprays, and improving application technology.

5) In addition to pass-through FPM Special Project money, we need greater support from FPM and NFS at the Regional and WO level for larger FIDR budgets for pesticide and alternative pest management research. Although the former is helpful for funding research close to the payoff stage, it does not help in beefing up our scientist and technician level or in funding more basic research needed to develop pesticide and alternative control technology.

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[illegible] to be two kinds of [illegible] technology.

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[illegible] and [illegible] (Bloomington, Ind.: Indiana University Press, [illegible])

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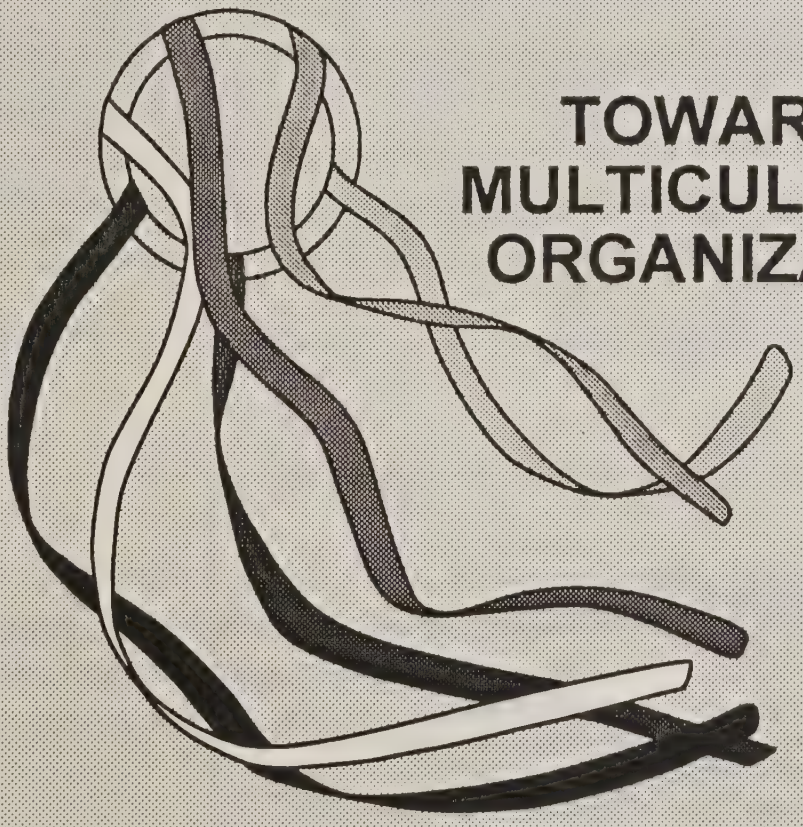
PAPERS, TRAINING NEEDS, AND RECOMMENDATIONS

PAPERS

FS Vision/Policy & Focus for Training & Development of Work Force
Moderator - Jack Barry

EMPLOYEE DEVELOPMENT in the FOREST SERVICE

TOWARD A MULTICULTURAL ORGANIZATION



A Presentation to the National Meeting of Pesticide Coordinators

Downtown Hilton
Salt Lake City, UT
Sep. 29 - Oct 2, 1992

EMPLOYEE DEVELOPMENT in the FOREST SERVICE

NOTES

EMPLOYEE DEVELOPMENT in the FOREST SERVICE

TOWARD A MULTICULTURAL ORGANIZATION

1

MILESTONES

3/91	Multicultural Organization Report
8/91	Natl Training Officers Mtg - Albuquerque NM
2/92	Implementation Plan for the Multicultural Report
4/92	Develop Vision, Mission, Policy, and Focus Areas
6/92	Structure 3 Workgroups on Training
8/92	Kickoff - Working in a Multicultural Society
9/92	Kickoff - Mgmt/Supvsry Competencies
10/92	Kickoff - Career/Succession Planning
92/93	Report of Workgroups on Training

2

EMPLOYEE DEVELOPMENT in the FOREST SERVICE

NOTES

VISION

We are competent and empowered to achieve the mission and goals of the Forest Service. We are valued and have high self-esteem. We support each other and are dedicated to mutual respect and cooperation among a multicultural, diverse workforce. We invest in a work environment that promotes life-long learning and skills development. We work in an atmosphere that excites, challenges, and fulfills us. Every person is equipped to meet the challenges of TODAY while preparing for the increasingly complex world of TOMORROW. Personal development receives high priority and is considered an essential part of organizational survival. We are viewed as an employer of choice, in part, because of this investment in people.

3

MISSION

Provide long-term leadership, programs, and premier training and development services, using state-of-the-art technologies, in order to:

- Enhance employee's performance,
- Increase employee's knowledge, skills, and abilities,
- Ensure continuous improvement, and
- Maximize return on investment in human resources.

4

EMPLOYEE DEVELOPMENT in the FOREST SERVICE

NOTES

PRINICIPLES and PHILOSOPHY

LEADERSHIP

Providing opportunities that challenge, inspire, empower, and bring out the best in people, preparing them for the next levels of responsibility.

SELF-DEVELOPMENT

Developing interpersonal and technical skills to promote confidence and self-esteem.

5

PRINCIPLES and PHILOSOPHY

(Continued)

CAREER/LIFE PLANNING

Establishing a personal vision and applying one's values to career goals. Provides the tools and options to make choices and assess changing personal needs throughout one's career.

WORK ENVIRONMENT

Encouraging an innovative, creative, people-oriented work environment. Openness, cooperation, and self-directed teamwork.

6

EMPLOYEE DEVELOPMENT
in the
FOREST SERVICE

NOTES

PRINCIPLES and PHILOSOPHY
(Continued)

DIVERSITY

Valuing people. Sensitivity to each other's needs, customs, cultures, and abilities.

CUSTOMER SERVICE

Understanding training and development needs.

7

PRINCIPLES and PHILOSOPHY
(Continued)

QUALITY

State of the art, responsive, timely

CHANGE

Meeting the challenges of changing trends, expanding complexities, and evolving uncertainties.

8

EMPLOYEE DEVELOPMENT
in the
FOREST SERVICE

NOTES

PRINCIPLES and PHILOSOPHY
(Continued)

SHARING RESOURCES

Identifying, sharing, and enhancing existing programs to make the most of our limited resources.

EVALUATION and ACCOUNTABILITY

Investing in the future: Measuring success by increased productivity, improved quality of work, and enhanced technical skills. Encouraging self-confidence, promoting communications, and developing interpersonal skills.

9

POLICY

It is the policy of the Forest Service to:

- **Invest in the development of all employees as a high priority to maintain a competent work force to carry out the leadership, managerial, and technical aspects of the Forest Service mission now and in the future.**
- **Provide training that will address the changing nature of the workplace and work force and provide skills and knowledge required to be competent, effective and productive.**

10

EMPLOYEE DEVELOPMENT
in the
FOREST SERVICE

NOTES

(Continued)

POLICY

- **Assure that it is the joint responsibility of each employee and their supervisor to prepare employees to assume greater responsibility for their present position and to broaden their experience for future positions.**
- **Assure that each employee has an individual development plan.**
- **Assure appropriate training and developmental opportunities are made available to all employees at each stage of their careers. Employees will receive career counseling to assist in planning their career goals.**

11

FOCUS AREAS

The following focus areas are of highest priority to achieve a consistent set of skills for the training and development of people.

MANAGEMENT COMPETENCIES: Provide skills, knowledges and competencies necessary to successfully manage in a multicultural environment and changing society.

SUPERVISORY COMPETENCIES: Provide skills, knowledges and competencies necessary for a successful first line supervisor to function in a multicultural environment. Provide continuing development of supervisors during their careers.

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EMPLOYEE DEVELOPMENT
in the
FOREST SERVICE

NOTES

(Continued)

FOCUS AREAS

TECHNICAL TRAINING: Provide the necessary technical and procedural skills to maintain a high degree of excellence in all disciplines.

CAREER PLANNING: Provide clear and concise progressive steps from entry to senior level positions for all major occupations in the Forest Service. Develop a career counseling system/mentor program.

SUCCESSION PLANNING: Provide training and developmental opportunities for employees to develop the skills needed for entry into higher level positions.

13

(Continued)

FOCUS AREAS

ORIENTATION/INTEGRATION: Provide the basic skills and knowledges that develop a foundation for all future work of new employees. Gain an understanding of the Forest Service mission, values and vision. Provide courses that build on the concept of power sharing, working in teams, cross cultural communications and problem solving.

WORKING WITHIN A MULTICULTURAL SOCIETY: Provide the skills and knowledges that share values necessary for working with people of different cultural traditions and diverse values. Prepare people for moving towards a multicultural and diverse organization by building human relations skills.

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EMPLOYEE DEVELOPMENT
in the
FOREST SERVICE

NOTES

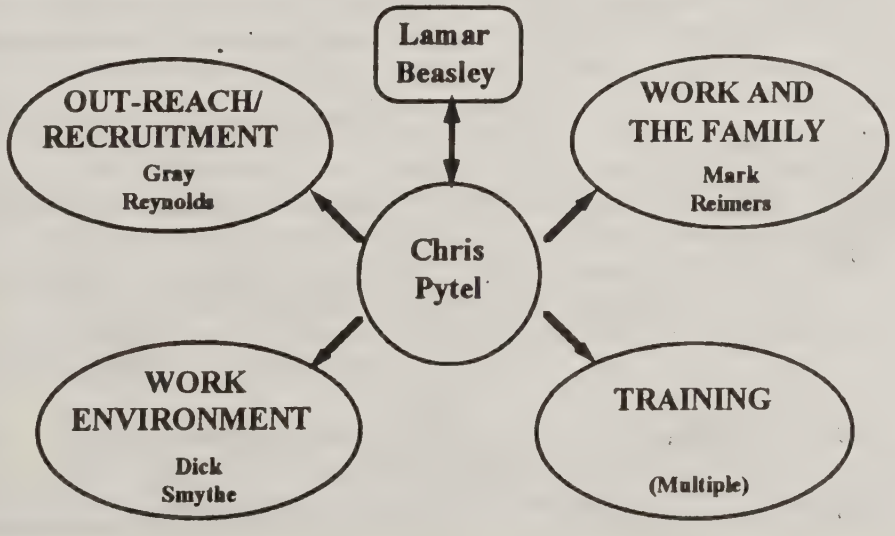
FOCUS AREAS

(Continued)

TRAINING EDUCATION AUTOMATION:
Provide local and national automated information to increase the efficiency and effectiveness of all training programs.

15

TOWARD A MULTICULTURAL ORGANIZATION



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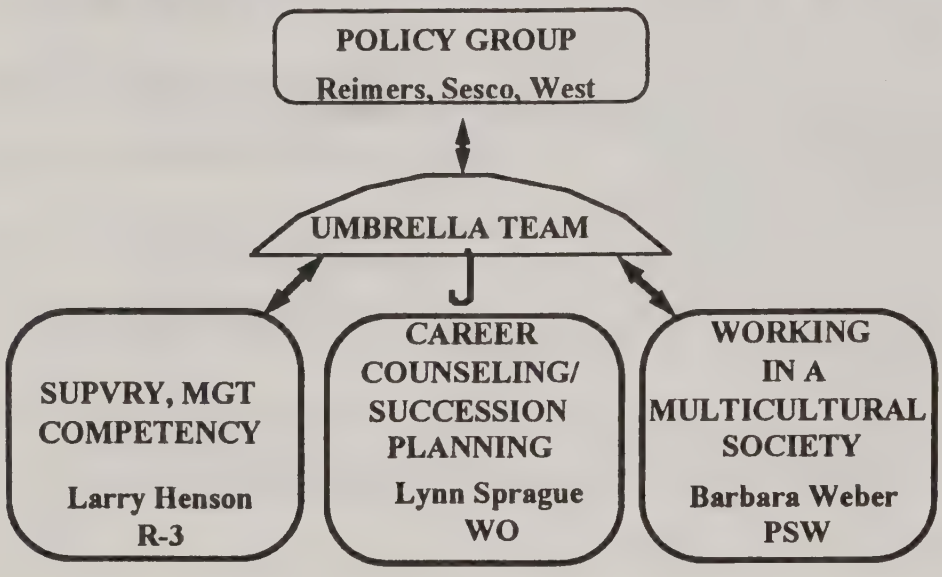
EMPLOYEE DEVELOPMENT
in the
FOREST SERVICE

NOTES

TRAINING WORK GROUPS



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LAWS & REGULATIONS
Moderator - Ed Monnig

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PESTICIDE LAWS AND REGULATIONS
THAT WILL AFFECT THE FOREST SERVICE IN THE 1990'S

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My talk will focus primarily on the new laws and regulations that will affect the way the Forest Service uses pesticides in the 1990's. Some of these new regulatory initiatives have been undertaken by EPA as part of its regulatory responsibilities under FIFRA, the Federal Insecticide, Fungicide, and Rodenticide Act. Others reflect the impact of laws such as the Endangered Species on pesticide use.

Time permitting, I would also like to go beyond the purely legalistic and thus to reflect a bit on some of the larger forces affecting the way the Forest Service conducts business.

As we look to the future it is apparent that two areas will receive increasing emphasis. These are the protection and improvement of human health and the protection and restoration of our physical environment.

These two concerns are very apparent as we scan the list of EPA pesticide regulatory initiatives. I will briefly discuss four of these:

Groundwater Protection Strategy

Endangered Species Protection and Pesticide Labelling

Certified Applicator Regulations.

Worker Protection Standards

GROUNDWATER PROTECTION STRATEGY

The impact of various contaminants on groundwater and the possible impact on drinking water sources has been an increasing concern to the public and various regulatory agencies. We have all probably seen reports of the results of EPA and state wellhead monitoring programs. I won't try to summarize all the statistics. A number of excellent publications are available such as the American Chemical Society's Information Pamphlet entitled Groundwater.

Contamination of groundwater has been discovered in many areas. A variety of contaminants have been found. Some of the most common indicators of contamination are nitrates from fertilization and irrigation return flows, fecal coliform from septic systems, solvents and fuels from leaking underground storage and pipelines, and brines from oilfields. However, with increases in analytical capabilities in which we can routinely get to part per billion levels we are increasingly detecting pesticides in groundwater across the country.

In the early 1980's EPA began to develop a groundwater protection strategy. On July 26, 1988 the EPA issued a Federal Register Notice noting the availability of a proposed strategy for protecting groundwater from agrichemicals.

In 1991 the EPA issued two guidance documents that outline the approach that the agency would like the States to take in protecting groundwater:

Protecting the Nation's Groundwater: EPA's Strategy for the 1990's (July 1991).

Pesticides and the Groundwater Protection Strategy (October 1991).

The strategy involves two basic elements. EPA would like the states to develop an overall comprehensive strategy for protecting groundwater that considers all the potential sources and coordinates all the existing regulatory programs as they relate to groundwater protection. Secondly, EPA would like the states to issue specific management direction for dealing with potential contaminants such as agrichemicals. For example, if a specific chemical such as aldicarb were monitored in grounwater, the states would be required to issue guidance on its use.

EPA personnel readily admit that some of groundwater protection strategy still exists as a "wish list." Unlike other regulatory programs there is no specific legislative basis for groundwater protection. The Clean Water Act, for example, makes little mention of groundwater. Thus the strategy must piggyback on other regulatory procedures. In addition, the EPA provides no funding to the states for implementing the strategy.

ENDANGERED SPECIES PROTECTION AND PESTICIDE LABELLING

Many of you probably had some involvement in EPA's first attempt to incorporate endangered species protection into the pesticide labelling process. This first attempt was, by most accounts, ill-conceived. EPA attempted to regulate on a crop and chemical basis. This approach led to many discrepancies such as situations in which a pesticide would be prohibited on specific crop in an area with T&E species, yet other uses of the same chemical were not restricted. In addition, EPA's public involvement was very poor.

EPA has now totally revised the approach. EPA is issuing interim protection guidance such as shown on the screen. The approach is based on species, and the guidance is provided by county. The approach is much simplified. Basically the applicator is asked two questions. Are you applying within an area containing a T&E species, as indicated on the county map? Are you applying a pesticide with an active ingredient listed in the brochure? If the answer to both questions is yes, then you are asked to follow certain limitations.

At this point the program is only voluntary. Of the approximately 3,000 counties nationwide, EPA figures that about 1,000 will be affected. EPA has issued about 130 bulletins to date. EPA hopes to issue final regulations making the program mandatory in these high priority counties within the next year, but much depends on the review by OMB.

CERTIFIED APPLICATOR REGULATIONS

On November 7 1990, the EPA published in the Federal Register a proposal to change the certification procedure for pesticide applicators. As you are aware pesticides are divided into two classes, general use and restricted use. Restricted use pesticides can only be applied by certified applicators or under the supervision of certified applicators.

Among other things, the proposed regulations would institute three levels of supervision in the application of restricted-use pesticides. The proposed regulations would in a sense set up three classes of restricted-use pesticides. The three levels EPA has proposed can be summarized as follows:

Use only by a certified applicator.

Direct supervision by a certified applicator who is required to be on site at all times and available at the point of use within 5 minutes.

Direct supervision by a certified applicator who is not required to be on site.

EPA also proposes increased training requirements for noncertified applicators.

I know the states had a number of concerns about these proposed new regulations, including enforcement of the three levels of supervision. Changes could be made in the final form of these regulations. These regulations were to come out in final form this year, but that is uncertain at this point.

WORKER PROTECTION STANDARDS

Worker protection standards represent a major new initiative for EPA. The regulations were first proposed in 1988. The final regulations were published on August 21, 1992 and the preamble and regulations cover 75 pages. Having plodded through the material I can verify that they are a highly effective sleep aid.

It is interesting to note that the regulations sat in OMB for three years between draft and final, which accounts for the long delay.

These regulations are aimed primarily at agricultural use of pesticides.

These regulations apply to any pesticide use in the production of agricultural plants, which includes food, feed, and fiber plants; trees; turf grass; flowers; shrubs; and seedlings.

Included are regulations that cover: Farms and forests, greenhouses, and nurseries.

Exceptions to the program include:

Wide-area public pest control programs sponsored by government entities.

Ornamental plants in parks and yards.

Right-of-way, pasture, and rangeland applications.

Control of vertebrate pests.

Research uses of unregistered pesticides.

and others.

These regulations set a variety of standards for:

Reentry intervals ranging from 12 to 72 hours (including pesticides such as Bt),

Entry restricted areas including nurseries and greenhouses,

Ventilation requirements for nurseries,

Worker notification and signing,

Protective equipment for applicators.

These regulations will require significant adjustments in some of our operations. Needless to say we all have our work cut out for us in understanding and applying these regulations

I would like to take the last few minutes to discuss what I see as important items on our agenda for the future, and some important trends for the future.

One involves the topic we just touched on--worker safety. As shown in the slide, the applicator is the vital link in the whole operation. Often he or she is out there alone on the front line, far removed from direct oversight. In this case 24 miles from the nearest road in the Bob Marshall Wilderness.

I have been fairly closely involved in the risk assessment process for a number of years. It has become clear to me that concerns for worker safety are beginning to limit our ability to do the job. For example, our most recent risk assessment show that we can back pack spray less than 1 pound of 2,4-D if we are to maintain our widely accepted 100-fold margin of safety. At this point it also unclear how realistic these concerns are. In many cases our estimates of worker exposure are based on inappropriate studies and may significantly overestimate worker dose. Some fairly simple steps can be taken to reduce worker exposure. But we don't know what these steps buy us in increased protection. (Show slides on front and rear mounted booms.)

I would like to see us form a work group to look at the problem of worker exposure and to make specific recommendations for future studies to be funded by NAPIAP and other sources.

ECOSYSTEM MANAGEMENT/ECOSYSTEM RESTORATION
FOREST HEALTH/BIODIVERSITY

These concepts are playing an increasingly important role in the Forest Service's management philosophy. While pesticides are often viewed as a tool to enhance commodity production, I believe there are broader applications.

Two examples come to mind. We are using pesticides to eradicate infestations of very aggressive noxious weeds from Wilderness areas. There is considerable public support for this work because of the understanding of the potential impact of exotic species on native ecosystems and biodiversity.

A second example involves attempts to restore western white pine to its former range. This species was largely eliminated In northern Idaho and western Idaho by white pine blister rust, an introduced pathogen. To compound the problem on these sites, later successional species such as Douglas-fir and the true firs are increasingly succumbing to root diseases. We thus have thousands of acres that are becoming permanent brush fields. Restoring the white pine will require controlling the brush. Mechanical methods are prohibitively expensive on many of these sites and can have much greater impact on site integrity. We are now investigating other possibilities such as the spot application of herbicides. These methods may provide the only realistic alternative to rehabilitate these sites.

LAWS + REGULATIONS
Moderator - Ed Mannig

Risk Assessment

EXECUTIVE SUMMARY

The U.S. Department of Agriculture (USDA) Forest Service (FS) Regions 1, 2, 3, 4, and 10 and the Bonneville Power Administration (BPA) have proposed to use various herbicides, carriers, and additives in programs to control unwanted vegetation. The programs are proposed to be carried out on rangeland, forestland, facilities, rights-of-way, recreation (administration), and riparian sites. A risk assessment was conducted to determine what human health risks and what risks of effects to nontarget species are posed by potential exposures to 21 herbicides and 4 carriers (or additives) as listed below:

- *Herbicides:*

Amitrole	Imazapyr
Atrazine	Mefluidide
Bromacil	Metsulfuron methyl
Chlorsulfuron	Picloram
Clopyralid	Prometon
2,4-D	Simazine
Dicamba	Sulfometuron methyl
Dichlobenil	Tebuthiuron
Diuron	Triclopyr
Glyphosate	Trifluralin
Hexazinone	

- *Carriers (or additives):*

Diesel oil	Kerosene
Limonene	Mineral oil

Nonchemical methods including manual, mechanical, biological, and prescribed burning techniques are also proposed to control unwanted vegetation. A description of the manual, mechanical, and biological methods and an evaluation of the risks of prescribed burning are presented in this document in addition to the chemical risk assessment.

Chapter I introduces the risk assessment document. Chapter II examines the nonchemical control methods used to control unwanted vegetation and provides a human health risk assessment for exposure of members of the public and workers to fire, smoke, and volatilized herbicides from prescribed burning operations.

Chapter III, consisting of eight sections that comprise the bulk of the document, examines the health risks to humans and the risks to nontarget species from the use of chemical control methods to manage unwanted vegetation. Sections III-A and III-B describe the risk assessment methods and the vegetation management programs evaluated for risk. Sections III-C, III-D, and III-E present the human health hazard analysis, exposure analysis, and risk

analysis, respectively. Sections III-F, III-G, and III-H present the nontarget species hazard, exposure, and risk analyses.

HUMAN HEALTH RISK ASSESSMENT METHODOLOGY

The methodology for this risk assessment employed three principal analytical elements–hazard analysis, exposure analysis, and risk analysis–to characterize the potential adverse health effects of human exposures to the herbicides and carriers.

Human Health Hazard Analysis

The human health hazards associated with using each herbicide or carrier were determined from extensive literature searches and relevant data submitted to the Environmental Protection Agency (EPA) in support of each of the pesticide's registration. This information was reviewed in particular to identify toxicity reference levels determined in laboratory animal studies for comparison with estimated program doses. The reference levels used in the risk assessment included systemic effect no-observed-effects levels (NOELs), reproductive/developmental NOELs, threshold limit values (TLVs), and cancer potencies (cancer slope factors). The neurotoxicity, immunotoxicity, genotoxicity, carcinogenicity, and synergistic effects of each herbicide and carrier were reviewed to develop the weight-of-evidence discussions for those endpoints.

Where data were lacking or scientific uncertainty existed for a particular pesticide about a specific toxic effect—for example, genotoxicity—the basis for the uncertainty was identified. Where possible, for the purposes of the risk assessment, a conclusion was drawn about whether the chemical might cause the effect in question based on the weight-of-evidence of all pertinent available data. Where sufficient ancillary data did not exist, no conclusion was drawn about whether the chemical might cause the effect in question.

Human Health Exposure Analysis

Herbicides used in the programs are proposed to be applied by four methods –aerial application, backpack, ground mechanical, and hand application.

For each application method, two human populations were evaluated in terms of their potential to be exposed to the herbicides and carriers. The first population at risk consisted of members of the public who live or work nearby, or who visit an area where the herbicides are being applied. These individuals may come into contact with the herbicide during application via spray drift or after application by touching contaminated surfaces or consuming contaminated water or food items. The second group at risk were the workers participating in the application operations. Workers included fuel truck drivers, pilots, mixers, loaders, applicators, and individuals who may perform more than one of these functions.

Exposure scenarios were developed for each application type to estimate doses to the public and to workers of each pesticide used in that application type. The scenarios took into

account the potential route of exposure, the relevant characteristics of the individual exposed, the time of inception and the duration of the exposure, the distance from the treated area, and the level of protection against receiving a dose from such an exposure that the person might possess.

In most cases, three levels of exposure were analyzed for both members of the public and workers: routine-typical, routine-extreme, and accidental. In addition, on facilities and riparian sites, backpack application may be used to apply herbicides up to the water's edge. In these cases, an additional level of exposure was included to account for this practice.

It is important to note here that the risk assessment does not quantify the probability or likelihood that any single member of the public will be exposed, but rather estimates public health risk assuming an individual is exposed under a given set of circumstances. In fact, the chances that any member of the public will actually be exposed in these operations are expected to be extremely low because of the remoteness of most application sites and because of the standard operating procedures the agencies employ to keep the public out of treated sites. Thus, the routine-typical public exposure scenarios were designed to estimate the most likely level of exposure that would occur assuming a person is exposed under the prescribed set of circumstances. The routine-extreme scenarios were designed to estimate what could be the highest exposure levels likely to occur, again assuming a person is exposed under the same set of circumstances. The accident exposures scenarios were designed to estimate the level of exposure that could occur to a member of the public only in the event of an emergency situation, such as a spill or aircraft jettison.

Exposures to members of the public were determined by evaluating the transport and fate of the pesticide in the environment and estimating the amount to which a person might be exposed by each potential exposure route. This methodology required knowledge of specific attributes of each pesticide used to determine its movement and fate in the environment after application and its persistence on different environmental surfaces and in various environmental media. Also important in this analysis were the distances between the edge of the treated area and the person themself or the items which the person might contact or ingest. These distances varied for each type of application–aerial, backpack, and ground-mechanical applications–and for the routine-typical, routine-extreme, and accident scenarios. Exposure to hand applications was not considered due to minimal drift.

Exposures to members of the public near the treatment area during or just after an application were evaluated for a variety of scenarios. These scenarios were chosen to represent the range of activities persons might be engaged in near these sites. Scenarios involving single routes of exposure included dermal exposure to offsite drift or vegetation or dietary exposure to water contaminated with offsite drift residues, contaminated fish, or berries. Scenarios involving multiple routes of exposure included both dermal and dietary exposures to hikers, berries pickers, anglers, or nearby residents. Assumptions of drift distances, offsite drift deposition, consumption amounts, and other parameters needed to calculate doses are provided in detail in this document. Inhalation exposure was not considered in the public exposure scenarios, due to the small contribution an inhalation dose would make to the total dose and the remote chance of inhalation occurring.

Exposures to workers were determined by extrapolating from doses found in field studies of similar types of pesticide applications. These studies most often based exposure estimates on an analysis of worker urine samples. Studies of this type were used where the work assignments were similar enough to the field study assignment to make the extrapolation appropriate. In estimating worker risk, information was used about the application equipment employed by each worker, the total amount of active ingredient applied on a daily basis, dermal penetration of each chemical, and the protective clothing worn during routine-typical and routine-extreme applications.

Scenarios developed for accidental exposures of both members of the public and workers included a direct spray of a person, direct spray of vegetation or water, immediate reentry into a treated area, and spills or jettisons of concentrated herbicides or mixtures..

Human Health Risk Analysis

Human health risks were evaluated in this risk assessment based on risk of systemic and reproductive/developmental health effects from chronic exposure, as well as the risk of cancer from repeated exposure to those substances considered possible carcinogens by EPA. In the prescribed burning risk assessment, risks were quantified for exposure to polynuclear aromatic hydrocarbons (PAHs) and volatilized herbicides in smoke from prescribed burning operations. Human health risks from PAHs contained in smoke from burning of woody vegetation were evaluated based on risk of cancer from repeated exposures. Human health risks from herbicides used in brown-and-burn operations were quantified for both chronic and cancer risks. In the pesticide risk assessment, human health risks were evaluated for exposures to the herbicides and carriers used in broadcast applications and in spot treatments. Human health risks from the herbicides and carriers were evaluated for both acute and chronic effects and for cancer risk.

Chronic health risks from the herbicides used in brown-and-burn operations were evaluated by comparing the estimated herbicide concentration in the air to the TLV. The TLV is an exposure limit established by the American Conference of Governmental Industrial Hygienists and represents the air concentration a person can be exposed to 8 hours a day, 40 hours a week, for a working lifetime, without suffering adverse health effects or significant discomfort. The TLVs are described in the hazard analysis; the airborne concentrations are estimated in the exposure analysis. The risks of adverse health effects were evaluated in terms of a margin-of-safety (MOS), which is the ratio of the air concentration estimated in the exposure analysis to the TLV. Risk increases as the estimated air concentration approaches the laboratory toxicity level—that is, as the MOS decreases.

Systemic health risks from the herbicides and carriers used in broadcast applications and spot applications were evaluated by comparing the estimated doses for each pesticide in each scenario to the laboratory-determined toxicity levels noted in the hazard analysis. The toxicity levels are described in the hazard analysis; the doses were calculated for each scenario in the exposure analysis. The risks of threshold effects were evaluated in terms of a margin-of-safety (MOS), which is the ratio of the dose estimated in the exposure analysis to the systemic or reproductive/developmental NOEL. Risk increases as the estimated dose approaches the laboratory toxicity level—that is, as the MOS decreases. In general, where the

MOS for a given estimated dose was calculated to be 100 or greater, the dose is described as posing a low risk of health effects. Where the MOS is calculated as less than 100 but greater than or equal to 10, the dose is said to pose a moderate risk of health effects. MOS's less than 10 pose a high risk of health effects. Where EPA has used an uncertainty factor other than 100 in determining their "safe" lifetime dose level (reference dose or RfD), this risk assessment uses the EPA uncertainty factor to set the appropriate MOS criteria to determine whether an estimated program dose presents a low, moderate, or high risk of human health effects.

The risk of a pesticide causing cancer was evaluated differently because it is assumed that a pesticide that may cause cancer has some chance of causing it at any dose level. In this analysis, cancer risks were calculated only for chemicals for which EPA has established a cancer potency value. These chemicals included the PAHs (benzo(a)pyrene, benzo(c)phenanthrene, benzofluoranthenes, perylene, and benzo(g,h,i)perylene), amitrole, atrazine, bromacil, picloram, simazine, trifluralin, kerosene, and diesel oil. Cancer risk was calculated for various categories of persons who may be exposed to the chemicals, based on a number of daily doses averaged over a 70-year lifetime.

HUMAN HEALTH RISK ANALYSIS RESULTS

Risks From Prescribed Burning

The prescribed burning risk assessment quantified risks from exposure to PAHs found in smoke from burning operations. The risk assessment also quantified exposure to volatilized fractions of the herbicides 2,4-D, glyphosate, hexazinone, picloram, and triclopyr in smoke, due to their application prior to the prescribed burning operation.

The public cancer risk analysis for PAHs indicated that, although the risk of cancer from exposure to any one of the chemicals analyzed was less than 1 in 1 million, 200 exposures to a combination of the five PAH compounds analyzed produced a cancer risk sightly higher than 1 in 1 million. Worker cancer risks were determined to be greater than 1 in 1 million after 30 exposures to a combination of the analyzed PAHs.

To evaluate the risk from inhalation of airborne concentrations of the herbicides which may be applied prior to prescribed burning, the estimated airborne concentrations were compared to the TLVs for each herbicide. In all cases, the ratio of the TLV to the estimated airborne concentration indicated negligible risk of health effects from inhalation of these volatilized fractions. A cancer risk analysis was also performed for inhalation of the herbicide picloram. This analysis indicated a cancer risk of less than 1 in 1 million.

Quantitative Risk Results

Risks to members of the public were determined from exposures to herbicides and carriers applied by aerial, backpack, and ground mechanical applications methods. Hand applications were not analyzed because they were not expected to expose the public, due to negligible drift and the small size of the areas treated. In general, low risks to the public were estimated during routine-typical operations for most herbicides and carriers considered for use in the programs. Exceptions were in the cases of diuron and trifluralin use in some scenarios. In routine-extreme operations, amitrole, atrazine, dichlobenil, diuron, prometon, simazine, and trifluralin all posed a moderate risk to members of the public in some scenarios. Furthermore, high risks of health effects were indicated from trifluralin use, due to its high bioconcentration potential in fish, in the scenarios involving human consumption of fish.

Scenarios were also developed in which herbicides and carriers may be applied up to the water's edge on facilities and riparian sites, using backpack applications. In the case of backpack applications to the water's edge on facility sites, moderate risks of health effects were indicated for amitrole, dichlobenil, diuron, prometon, and simazine. In addition, high risks of health effects were indicated for trifluralin, due to its high bioconcentration potential in fish. In the case of backpack applications to the water's edge on riparian sites, moderate risks of health effects were indicated for amitrole, diuron, and simazine.

In all cases under the routine-typical and routine-extreme scenarios, the cancer risk to members of the public was less than 1 in 1 million for those herbicides and carriers considered possible carcinogens by EPA.

Workers were at a much greater risk than members of the public from herbicides and carriers used in the programs. Risks to workers were examined from all four types of applications—aerial, backpack, ground mechanical, and hand applications. Given similar conditions, lower risks were observed for workers operating aerial and ground mechanical equipment, even though the total amount of active ingredient applied in a single day was higher with these types of equipment. Risks from applying chemicals with backpack and hand application equipment were higher, primarily because the proximity of the worker to the nozzle or orifice through which the chemical is released and to the container in which the chemical is carried, increase the likelihood that the worker will contact with the chemical one or more times and that the chemical will remain on the worker's skin for some period of time.

Under the routine-typical scenarios for aerial and ground-mechanical applications, moderate or high risks of systemic or reproductive/developmental health effects were indicated for the following herbicides and carriers on at least one types of site: amitrole, atrazine, 2,4-D, dichlobenil, diuron, prometon, simazine, trifluralin, and diesel oil. Of all worker types analyzed for aerial and ground-mechanical applications, the mixer/loaders in both operations were at the highest risk.

The herbicides and carriers indicated above as posing moderate or high risks to aerial and ground-mechanical workers also posed moderate or high risks to backpack and hand applicators treating some of the site types. In addition, moderate or high risks were indicated for the following herbicides and carriers on at least one of the site types: bromacil, hexazinone, mefluidide, tebuthiuron, triclopyr, and kerosene.

Under routine-extreme scenarios, many of the herbicides and carriers in the analysis showed up as potentially posing moderate or high risk of health effects. Only those herbicides and carriers with the lowest toxicity may be used under routine-extreme conditions with low risk of adverse effects.

Cancer risks to workers during routine operations were based on the average number of days in a lifetime a worker would apply each chemical. Based on the assumptions used in this analysis, many workers had a greater than 1 in 1 million risk of developing cancer from the use of amitrole, atrazine, bromacil, simazine, and trifluralin. In some cases, the risk of developing cancer from the use of atrazine or simazine were greater than 1 in 10,000.

Determination of risks from accidental exposures to herbicides and carriers was also included in this document. Public accident scenarios in which drinking water (or fish living in this water) is contaminated by herbicides or carriers being directly sprayed on the surface or jettisoned or dumped into the water body posed the highest risks. In these scenarios, many of the herbicides and carriers pose moderate or high risk of adverse health effects. In some cases, cancer risks in these scenarios were greater than 1 in 1 million for amitrole, atrazine, simazine, and trifluralin.

In the worker accident scenarios, many of the herbicides and carriers pose moderate or high risk of adverse health effects. In some cases, cancer risks in these scenarios were greater than 1 in 1 million for amitrole, atrazine, bromacil, simazine, and trifluralin, and greater than 1 in 10,000 for atrazine and simazine.

Qualitative Risk Results

Some health effects cannot be evaluated quantitatively and are therefore reviewed qualitatively. The health endpoints that are reviewed qualitatively include mutagenicity, neurotoxicity, immunotoxicity, and synergism.

The weight of laboratory evidence from numerous *in vivo* and *in vitro* tests that a chemical is mutagenic or genotoxic is a principal consideration in the determination of whether the chemical poses a risk of causing heritable mutations in germs cells, leading to genetic defects or disease in offspring, or of causing mutations in somatic cells that may lead to cancer. The weight of evidence indicates that the following herbicides are not mutagens for the purpose of this risk assessment: amitrole, chlorsulfuron, clopyralid, dichlobenil, glyphosate, hexazinone, imazapyr, mefluidide, metsulfuron methyl, picloram, sulfometuron methyl, tebuthiuron, trifluralin, and triclopyr. Bromacil was considered to have a low potential for mutagenic responses. The weight of evidence indicates that atrazine, 2,4-D, diuron, and simazine, and the carrier diesel oil are mutagenic. The level of risk these latter chemicals represent in terms

of causing human mutations is uncertain. Not enough information was available to evaluate prometon or dicamba for mutagenicity.

Neurotoxicity assays address the question of whether a test chemical causes damage to the human nervous system. The hen delayed neurotoxicity assay is the most widely employed to test for nervous system damage. Neurotoxic effects were observed in five of the herbicides that were evaluated. Bromacil, 2,4-D, dicamba, dichlobenil, and trifluralin may potentially cause neurotoxic effects. The level of risk of causing human neurotoxic effects that these chemicals pose is unknown. The herbicides amitrole and glyphosate did not cause neurotoxic responses in test animals. No information was available on the possible neurotoxic effects of any of the remaining herbicides.

A number of laboratory assays have been recommended by scientists to evaluate the risk that a chemical might adversely effect the human immune system. Immunoassays include tests for immunosuppression, uncontrolled proliferation, alterations of defense mechanisms, and allergic responses. Most herbicides have been tested in a single system, the dermal sensitization assay in guinea pigs. Several studies indicated that the following chemicals were not dermal sensitizers: chlorsulfuron, dichlobenil, glyphosate, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr. Hexazinone and prometon tested negative for dermal sensitization but further review of these studies is required by EPA before a determination can be made. The herbicide 2,4-D was not a dermal sensitizer; however, it did cause enhanced lymphocyte proliferation, immunostimulatory effects, and immunoglobulin-mediated allergic hypersensitivity. Atrazine, dicamba, and trifluralin did cause dermal sensitization. No information was available on the possible immunologic effects of the remaining herbicides in the program.

Synergistic effects can be caused by exposure to two chemicals simultaneously or within a short period of time. These effects are not predictable and their combined effect may be greater or different than the effects of the chemicals when taken alone. Synergism testing is done to determine if a test chemical's toxicity is enhanced (potentiation), reduced (antagonism), or unaffected when the chemical is administered with a second chemical. The herbicides 2,4-D and picloram produce dermal irritation in test animals when administered together, but not when taken alone. The toxic effects of kerosene may be potentiated by antiemetics, epinephrine, or alcohol. No information was available on possible synergistic effects for any of the other program chemicals.

WORKER RISK MITIGATION

A discussion was provided in the document to address methods of reducing risks to workers involved in herbicide application programs. An effective risk mitigation technique is to limit the amount of herbicide a single worker handles on any given day such that his dose does not exceed the low risk level. Tables have been provided in the document that indicate the maximum total amount in pounds of active ingredient that a single worker may handle daily with low risk of systemic or reproductive health effects. In most instances, the application rate needed for a particular purpose cannot be adjusted or the efficacy of the treatment may

be sacrificed. However, by altering maximum treatment area as needed application rates are determined, risks of worker health effects can be kept low. These tables may be used as a tool to plan applications, by the selection of the herbicide used, and the adjustment of application rate, application acreage, application equipment used, and types of workers exposed, with the goal of protecting worker health.

Several suggestions are also made in the document on ways to reduce worker risk without changing application schedules and strategies. The mitigating measures include ways to reduce the potential for herbicide residues to reach the skin surface, reduce the amount of time residues remain on the skin surface, and reduce the chances of recontamination.

To reduce the potential for herbicides to reach the skin surface, protective clothing and equipment checks should be routinely employed. Because most exposure for pesticide workers is through the dermal route, not through inhalation or dietary exposure, the use of protective clothing can substantially reduce worker doses. Fabric finishes and the use of an undergarment layer, such as a tee-shirt, also decrease the chemical dose received. Faulty equipment is the most obvious contributor to increased doses in all of the worker studies evaluated. By employing routine equipment checks for leaks and malfunctions and by promptly setting faulty equipment aside for repairs, unnecessary herbicide exposures can be avoided.

Washing and showering can be effective in reducing the amount of time herbicide residues remain on the skin surface. While herbicides are not absorbed instantaneously through the skin, over time some portion of the herbicide remaining on the skin surface will be absorbed. Therefore, by minimizing the remaining available pesticide on the skin surface, the dose to that worker may be reduced. Showers provided at the Forest Service and BPA facilities would ensure that workers have the opportunity to shower prior to engaging in other activities.

Reducing the chance of recontamination is also an effective method of reducing risk. Laundering practices are important in minimizing herbicide exposure. The availability of laundering facilities at the Forest Service facilities would help to reduce risk; herbicide residues on clothing could be transferred to car upholstery or items in the home and recontaminate workers when they contact the items again. Trucks and other equipment used throughout the day can be a source of recontamination for some workers; door handles, steering wheels, gear shift knobs, and seat covers could all become contaminated during the day. Workers could avoid significant recontamination of their hands if they wore a minimum of at least one pair of cotton gloves whenever they were driving or traveling in such a vehicle. To avoid general recontamination, separate washable absorbent cotton seat covers could be employed in vehicles used in the application operations. To further limit transference of herbicides to workers, the vehicle in which they travel to and from the application sites should not be used for other travel.

NONTARGET SPECIES RISK ASSESSMENT METHODOLOGY

The methodology for the nontarget species portion of this risk assessment employed the same three principal analytical elements as the human health risk assessment–hazard analysis, exposure analysis, and risk analysis–to characterize the potential adverse effects on selected representative wildlife and aquatic species from exposures to the herbicides and carriers.

Nontarget Species Hazard Analysis

The nontarget species hazard analysis summarized laboratory and field study findings that evaluated the toxicity of the herbicides and carriers to wildlife and aquatic species. In many cases, toxicity studies with laboratory animals were used in this risk assessment because of the lack of specific wildlife studies. The results of laboratory animal studies are considered to be representative of the effects that would occur in similar species in the wild.

The hazard involved in using each herbicide or carrier was determined from extensive literature searches and relevant data submitted to EPA in support of the pesticide's registration. This information was reviewed to determine toxicity reference levels for comparison with estimated program doses. The reference levels included oral median lethal doses (LD_{50}s) and median lethal concentrations (LC_{50}s) to be used in the quantitative risk assessment.

Nontarget Species Exposure Analysis

Wildlife doses were calculated for a group of wildlife species representative of those typically found in areas supporting rangeland, forest land, or riparian vegetation in the Rocky Mountain regions. These species represent a range of phylogenetic classes, body sizes, and diets for which biological parameters are generally available. Typical and extreme acute dose estimates were determined for each representative species for each of the three major exposure routes–dermal, ingestion, and inhalation. Because the herbicides degrade relatively rapidly and sites are normally treated only once per year, no analysis of chronic wildlife dosing was performed. Because the herbicides show little tendency to bioaccumulate (although several tend to bioconcentrate in aquatic environments), long-term persistence in food chains and subsequent toxic effects were not considered a problem and were not examined in the risk assessment.

Aquatic species exposures were estimated for a group of representative aquatic species typically found in the Rocky Mountain regions. The analysis assumed that the aquatic organisms were exposed to herbicide residues by immersion in water bodies that had received varying levels of herbicide through drift or direct spraying. Two types of water bodies were employed in this analysis–a 6-inch deep stream and a 6-foot deep lake. Typical exposures were based on water concentrations in areas where the water surface is partially protected from drift by a vegetative canopy. Extreme exposures were based on water concentrations in an area with no protective canopy.

All herbicide treatments were assumed to be made via broadcast applications from aircraft. Aerial applications of herbicide have a significant potential to affect wildlife because these broadcast treatments may cover wide geographic areas encompassing many different types of terrestrial and aquatic habitats. Ground-based herbicide applications were not analyzed in the risk assessment because they have a lower potential to affect wildlife and aquatic species than a comparable aerial application of the same herbicide at the same application rate.

Nontarget Species Risk Analysis

The wildlife risk analysis compared the estimated acute doses to the representative wildlife species with the available hazard information on the most closely related species. To estimate the program's potential risk on wildlife, the doses calculated for each representative species were compared to toxicity data on laboratory test organisms (toxicity reference species). In many cases, however, toxicity information for the representative species was unavailable. Therefore, it was necessary to select a closely related species for which toxicity data were available.

The aquatic species risk analysis compared the estimated environmental concentration (EEC) with the laboratory-determined LC_{50} for the most closely related laboratory test species. The stream and lake scenarios were devised to represent the broadest possible range of aquatic habitat types in the Rocky Mountain regions. Risks were then calculated for two aquatic species for which toxicity data are generally available. Trout were chosen to represent cold-water fish in both streams and lakes and *Daphnia* were chosen to represent aquatic invertebrate species in both habitat types.

NONTARGET SPECIES RISK ASSESSMENT RESULTS

The results of the risk analysis indicate that potential risks to individual animals are low for most of the herbicides. Estimated doses for typical exposures result in a low risk from all herbicides and carriers. The application rates for several of the herbicides, coupled with extreme exposure estimates, may present moderate risks to individuals of some species. However, the estimated exposures exceed the LD_{50} (high risk) only under extreme exposure assumptions for the longtail vole during the use of 2,4-D, dicamba, tebuthiuron, and triclopyr, and for the belted kingfisher and the river otter during use of trifluralin.

The program's potential risk to representative aquatic species was determined by comparing the toxicity reference values for trout and aquatic invertebrates with the EECs for the typical and extreme stream and lake scenarios.

In the typical stream scenario, dichlobenil, diuron, and simazine may present a moderate risk to trout in streams. Triclopyr, trifluralin, diesel oil, and kerosene may present a high risk. Water concentrations of amitrole, atrazine, and dichlobenil in the typical stream scenario may present a moderate risk to aquatic invertebrates in streams while diuron, simazine, trifluralin, and diesel oil may present a high risk. In the extreme stream scenario, atrazine, bromacil, 2,4-D, dicamba, and picloram may present a moderate risk to trout while dichlobenil, diuron,

prometon, simazine, triclopyr, trifluralin, diesel oil, and kerosene may present a high risk. For aquatic invertebrates, clopyralid and dicamba may present a moderate risk and amitrole, atrazine, 2,4-D, dichlobenil, diuron, prometon, simazine, trifluralin and diesel oil may present a high risk.

In the typical lake scenario, diuron, triclopyr, and limonene may present a moderate risk to trout in lakes while trifluralin, diesel oil, and kerosene may present a high risk. For aquatic invertebrates in lakes, atrazine, dichlobenil, diuron, simazine, and trifluralin may present a moderate risk while diesel oil may present a high risk. In the extreme lake scenario, dichlobenil, diuron, and simazine may present a moderate risk to trout in lakes while triclopyr and kerosene may present a high risk. For aquatic invertebrates, atrazine and trifluralin may present a moderate risk and diuron, simazine, and diesel oil may present a high risk.

Table III-C-1. Acute Toxicity Classification and Acute Toxicities of the Herbicides Being Evaluated for Vegetation Management in Relation to Other Chemicals

Toxicity Category	Herbicide or Other Chemical Substance	Oral LD_{50} for Rats (mg/kg)	Equivalent Human Dose
IV Very slight		5,000 - 50,000	More than 1 pint
	Sugar	30,000	
	Kerosene	28,000	
	Mineral oil	>20,000	
	Ethyl alcohol	13,700	
	Diesel oil	7,380	
	Chlorsulfuron	5,545	
	Imazapyr	>5,000	
	Sulfometuron methyl	>5,000	
	Simazine	>5,000	
	Metsulfuron methyl	>5,000	
	Trifluralin	>5,000	
	Limonene	>5,000	
III Slight (caution)		500 - 5,000	1 ounce to 1 pint
	Mefluidide	>4,000	
	Glyphosate	4,320	
	Clopyralid	4,300	
	Dichlobenil	4,250	
	Picloram	4,012	
	Bromacil	3,998	
	Diuron	3,750	
	Table salt	3,750	
	Bleach	2,000	
	Aspirin, Vitamin E_3	1,700	
	Hexazinone	1,690	
	Prometon	1,290	
	Amitrole	1,100	
	Formaldehyde	800	
	Dicamba	757	
	Atrazine	672	
	Tebuthiuron	644	
	Triclopyr	630	
II Moderate (warning)		50 - 500	1 teaspoon to 1 ounce
	2,4-D	375	
	Caffeine	200	
I Severe (danger - poison)		0-50	1 teaspoon or less
	Nicotine	50	
	Strychnine (rodenticide)	30	
	Parathion (insecticide)	13	
	TCDD (a dioxin)	0.1	
	Botulinus Toxin	0.00001	

Thurs aft 1430 - 1500

PESTICIDE COORDINATOR INFORMATION NEEDS

1) Need to know of changes which affect operating assumptions:
   a) FIFRA -- registration changes (eg. Roundup change)
   b) NEPA -- rules and appeal rules
   c) NFMA - rules and appeal rules
   d) Policy changes -- FSH 2109.14 & FSM updates
   e) Regional or WO direction of interest nationally
      1. What is the status of QA/QC teams needed for GLP studies? Who are they? How can we get them to review our projects?
      2. LAI status (see later)?
   f) EPA information
      1. Current pheromone registration policy
      2. Status of "Safer pesticide" policy -- potential impact of same
      3. Current pyrethroid insecticide policy (holding back registrations pending policy)
      4. Status of efficacy testing and registration
   g) General information
      1. "Short Subjects and Timely Tips" - reactivated to alert the Regions to important information relevant to the pesticide program.
      2. Pesticide & Toxic Chemical News
      3. Chemical Regulation Reporter; The Bureau of National Affairs
      4. Federal Register

Quick Question -- How many in this room have a DG mailing list for their forest level pesticide coordinators? How many have one for the National (Regional) Pesticide Coordinators? Both?

2) Flip side -- WO needs regional information input!

3) Need current technology updates!!!
   a) Who is doing what that is working -- and not working
      1. Tools?
      2. Application methods
      3. Application Rates
      4. Specialized local needs -- especially ones which may not really be local needs at all
      5. Significant variations in product performance
      6. Significant observations of ecological concern
   b) What is being done with products to make them more acceptable/user friendly (eg. oil substitutes)

4) Need information to fill data gaps
   a) What is being done to fill them
      1. R-8 exposure studies on Garlon 3A, Garlon 4, and Glyphosate
      2. Others?
   b) GLP protocol effects on this process

5) Risk assessments needs:
(Note my list is available by DG or hard copy -- would like help to get it current!! Specific question -- Amdro; done or not?)

a) Improved the Risk Assessment process:
   1. Timely contracting: We need to develop sources (other than LAI) which are **timely** in their production, or
   2. National R.A. team: Develop our own process to allow Risk Assessment to be done in-house in a responsive manner.
      a. Programming to generate MOS or Reference Dose is basic!
      b. Format is cookbook at least for herbicides
      c. Move to generic risk assessment which could be adapted -- by us -- to regional needs?

b) Current risk assessments/background checks desired by R-8:
   1. Methyl oleate (vegetable oil substitute for petroleum based oils)
   2. Sunflower oil (vegetable oil substitute for petroleum based oils)
   3. Penevator (mineral oil sub for diesel oil)
   4. Hy-Grade and Hy-Grade II (mineral oil sub for diesel oil)
   5. Aquatic pesticides risk assessment (recognizing that a decision was made prior to Larry Gross' retirement [that a national R.A. would not be done for aquatic pesticides] we feel that a national R.A. should be done with regions then able to tier EIS analyses to it. Lack is a potential legal problem!)

c) Clarification of the process:
   1. Just how detailed a process of risk assessment is needed if a product is cleared for use as a food additive by FDA. We have four clear cases of this question: sunflower oil (a food), methyl oleate (a vegetable oil) HyGrade (an oil allowed for use on food processing machinery -- with an established food tolerance), and red dye #28 (which has a D&C clearance under the FDA).
      a. Are FDA tests done to achieve these ratings?
      b. Are things like LD_{50}, and other toxicity reference tests evaluated?
      c. Are the test results available for our review and use?

6) EISs needed:
   a) Nursery pest management (in process -- but when can we expect it?)
   b) Seed orchard pest management (in process -- but when can we expect it?)
   c) Aquatic pesticides (see 5.b.5.)

7) Need listings of:
   a) "approved" <u>disposal facilities</u> for obsolete or surplus pesticides, AND
   b) "approved" <u>testing labs</u> which are capable of pesticide residue analysis during project or program monitoring. In light of the GLP protocols now in force for registration data the latter problem is of great concern.

8) We need (national?) FPM direction concerning pesticide project monitoring:
   a) Protocols/sampling designs
   b) Or at least some national direction as to minimum intensity and frequency of sampling -- so as to assist the Forests in their M&E efforts.

9) We need economics assistance:
   a) Consistent FPM rationale for valuing forest outputs from the pesticide program:
      (It is currently almost impossible to compare alternatives with each other on an economic basis in a consistent manner)
      1. Wildlife habitat improvement
      2. Recreation value
      3. "Ecosystem" improvement value
      4. T&E habitat improvement/species recovery value
   b) Expert system for FPM economic analysis?

Needs that are not "information needs":

1) GLP impact on pesticide registration, efficacy testing, and monitoring?

2) Rethink contracting for the procurement of pesticides. Distributors are being given (essentially) fixed sales prices by manufacturers with active encouragement to provide services as the differentiating value between themselves and their competitors. However, this is not an allowable criterion in federal bidding so we have tie bids from all distributors of a given product in our procurement process.

3) Proactively encourage distributors to take back (at our cost, if necessary) empties. They could clean and reuse or dispose of the containers in a better manner than is currently done.

4) Clarification of the status of the Forest Service's Restricted-Use-Pesticide Applicator Certification program. What is our relationship to state certification programs supposed to be? Does it vary from state-to-state or is our training appropriate for all Forest Service lands/applications? Does our authority change from state-to-state? Was our initial authority restricted to five years? Longer? Has it been renewed as needed or are we in the twilight zone of FIFRA?
   a) Are we supposed to file any significant update to the program to the Department per 40 CFR 171.7(E)(2)(d)(1)(iv).
   b) Are we supposed to file annual report of certified personnel as at 40 CFR 171.7(E)(2)(d)(1)(i) and form FS-2100-4.

5) One of the biggest needs in the herbicide program is for FPM to open the technology development $ pot to herbicide projects. There is significant missing data on ecological effects which is ineligible for NAPIAP $s (not necessary for registering the product) and also is ineligible for TD $s (specifically excluded in the call letter for project submission). Most of this work is not getting done! and, it is very likely to cost us the program in the not-so-distant future.
   a) As a specific example of things not routinely getting done -- we need information on the residual plant population after herbicide treatments. We can state with reasonable assurance what the treatment will kill ("efficacy"), but we do not have good data describing subsequent plant populations and successional patterns. This is a critical need right now.

Note: In Region-8 at least two NAPIAP projects currently funded fall into this category -- but they are linked directly to registration requirements (food/cover/nesting value of residual vegetation to game, non-game, and T&E species of animals). This is a good start -- but we need to find $s to fund non-registration data studies concerned with ecological effects.

TRAINING NEEDS

Training Needs

Training needs were identified during the meetings for the following topics:

1. Good laboratory practices.
2. Use of immuno-assay kits for detecting pesticides.
3. Ground and air pesticide application (at Regional level).
4. Forest and range ecosystem management.
5. Risk/Benefit communications and public relations.

RECOMMENDATIONS

Recommendations

The following recommendations were derived from participants comments:

1. Need to improve communications between WO/FPM PUM&C and pesticide coordinators and between pesticide coordinators and WO/FPM PUM&C.

2. Need to revive publication of Timely-Tips.

3. Need another national pesticide coordinators meeting within one year.

SPECIAL CRITIQUES

by

Dave Thomas, Pat Shea, and Charles Hatch

A Field Perspective

Critique - Dave Thomas, Eldorado NF

First, I really appreciated the opportunity to be here, thank you.

Facilities: Excellent - Downtown Hilton has excellent meeting facilities. Close to restaurants.

1. As Jesus stated on the first day, agenda seemed to arrive late - I would have preferred to know what to expect sooner. I assumed that the Regions would each share what they are doing in PUM&C. I had certain expectations for being here prior to the agenda.

2. Agenda was well prepared but seemed a bit ambitious. A lot of information in only 3 days, especially in developing a strategic plan.

3. Stated objective of meeting - very good, but I believe there should have been other stated objectives, such as "information sharing."

4. The consultant that was hired, Mike, did an extraordinary job, but I believe he could have used more allotted time, as could have the working groups.

5. The working group I worked with worked very well together, everyone participated and our group leader did an excellent job in keeping the group moving.

6. I appreciated the fact that Jim Space participated the entire meeting.

7. I felt that there were too many handouts to get home easily.

8. Overall - I would have liked to had more time to work on the strategic plan.

9. The meeting should have been expanded for more time - perhaps 4 days.

10. I learned a lot from many of the speakers, but some speakers provided information that I was already aware of - I'm not going to mention which ones, because I found all speakers were very credible.

11. It would have been good if the agenda titles could have been expanded so the reader would have a better feel for the "actual" topic.

12. I was a little disappointed that more field level people weren't there.

13. Overall, I felt the meeting was very successful, but could have been expanded a bit.

Again, thanks for letting me participate, and I hope to see you next year at your next annual meeting.

My original objectives without agenda:

A. Learn what was going on nationwide with PUM&C.

B. Be informed on newest technology.

C. Share with the group the "good" things R-5 is doing. I brought slides, a 6 minute video, two state-of-the-art NEPA documents and a 2-page briefing paper.

Upon learning of the development of a strategic plan, I changed my expectations.

That I could be part of stratetic plan representing forest level input.

Critique

Pat Shea - PSW

1. Asked participants to do too much with time allotted.

2. Question often asked was "Are we doing someone else's job?" I see this as a double-edged sword i.e. "We" may be but it is also an opportunity to participate in determining the direction of the PUM&C staff.

3. Uneasy feeling that the strategic planning session was used as a complaint session.

4. Excellent facilitor - professional and hardworking.

Other portions of the meeting:

1. Presentations were quite informative, on the mark, and mercifully brief... (ex. B/C weeds, etc.).

2. Extreme frustration with lack of time allotted to interaction. Q&A time must be provided for after each session.

   These meetings must provide a venue for exchange of information and experiences between Regions/Stations, etc. This also provides an opportunity for the PUM&C staff to get input firsthand from the users.

3. Relevance of training of work force presentation. No question it is an important subject but question its relevance/appropriateness for this meeting.

4. Need more than one PUC meeting every 2-3 years. Strong recommendation for an annual. Also return to more traditional format.

5. Recommendation

   Organize next meeting around Paul Mistretta handout!!!

MESSAGE DISPLAY FOR BARRY, JACK

CRITIQUE

Charles Hatch - NA

To J.BARRY:RO5H
CC C.HATCH
CC J.COTA:WO
CC G.HERTEL
CC R.WOLFE

From: CHARLES L HATCH:S24A
Postmark: Oct 16,92 1:46 PM Delivered: Oct 16,92 10:45 AM
Status: Certified Urgent
Subject: CRITIQUE?

Message:
IT WAS A GOOD MEETING. SOME GOOD THINGS WERE STARTED. FACILITIES WERE EXCELLENT. GOALS WERE UNREALISTIC. NOT ENOUGH TIME TO ACCOMPLISH STRATEGIC PLANNING TASKS - NOR WAS THERE APPROPRIATE TIME FOR INSTRUCTION ON TEAM ASSIGNMENTS... THIS MEANS THAT MUCH OF THE INFORMATION DEVELOPED FROM THE VARIOUS TASK GROUPS WAS EITHER INACCURATE OR INAPPROPRIATE... OPPORTUNITY WAS LOST, THE SPIRIT OF ENTHUSIASM AND COOPERATION WAS HIGH, YOU COULD HAVE TAKEN ADVANTAGE OF THIS AND RALLIED THE INDIVIDUALS INTO A UNIFIED GROUP TO TAKE ON A CHALLENGING TASK OVER THE NEXT YEAR AND BEYOUND... INSTEAD YOU REINSTILLED THE WE (WO)-THEM (REGIONS, STATIONS, NA) MENTALITY. THERE WAS MENTAL FRAGMENTATION WITH NOTHING TO RALLY AROUND EXCEPT OUR OWN INDIVIDUAL ORGANIZATIONS... "REAL LEADERSHIP WAS NOT FORTHCOMING".. THESE ARE MY OBSERVATIONS AFTER AGRESSIVELY SEEKING OUT THE FEELINGS OF MANY OF THE PARTICPANTS. I RECOMMEND THAT YOU IMMEDIATELY FOLLOW UP WITH A MESSAGE FROM WO TO THE PARTICIPANTS EXPRESSING YOUR ENTHUSIASM FOR WHAT WAS ACCOMPLISHED; LET THEM KNOW HOW IMPORTANT IT IS THAT "THEY" DEVELOP THE STRATEGIC PLAN; AND HOW EXCITED YOU ARE AT THEIR INTEREST IN HAVING MORE FREQUENT MEETINGS. ETC. ETC. YOU STILL HAVE THE OPPORTUNITY TO RALLY THE TROOPS... IN SHORT, THE MEETING LEFT THEM WITH NOTHING TO RALLY AROUND!! DONT WAIT 6 MO TO DO SOMETHIN

----------X----------

INDIVIDUAL CRITIQUES

CRITIQUE OF NATIONAL PESTICIDE COORDINATORS MEETING

Salt Lake City, UT
September 29 - October 2, 1992

1. Did this meeting meet your needs and expectations?

If YES - H O W ? ? If NO - W H Y ? ? BE SPECIFIC!!

Yes and No. The mixed ~~no~~ objectives of the meeting (both information and strategic planning) made fulfilling ~~meeting~~ all objectives very difficult. I got a lot of good information and I felt a that there was alot of good information and critique give

2. What are your expectations on followup of issues and needs? Are you willing to participate on ad hoc committees to work on issues and needs?

I think there is a need for several followup working groups. Including would be groups examining issues like worker exposure + related research needs; expediting the risk analysis process; training needs, etc I'd be willing to help.

3. Did this meeting broaden your perspective and vision of your job as a pesticide coordinator?

Yes it did and I appreciate that aspect

4. What training do you need to assist you in performing your pesticide coordinator duties? e.g. risk assessment, GLP, and risk/benefit communications.

(1). Risk/benefit communicatia.

(2). Risk assessment methods & interpretatia.

5. How frequently do you believe this meeting should be held? What month of the year?

Next Meeting should be in a year - late fall or winter

6. Did you find the facilities to be adequate? Suggestions??

The Meeting Hall the first 2 day was good. Meeting area on thursday was inadequate

7. Any additional comments:

Ed Manning — NAME

RLTCFRM — ORGANIZATION

406 329-313 — PHONE NUMBER

CRITIQUE OF NATIONAL PESTICIDE COORDINATORS MEETING

Salt Lake City, UT
September 29 - October 2, 1992

1. Did this meeting meet your needs and expectations?

If YES - H O W ? ? If NO - W H Y ? ? BE SPECIFIC!!

yes but I was hoping to get more specific material. I did not anticipate ~~the~~ trying to develop a strategic plan. IT appeared that we had too much to do with the time we had.

2. What are your expectations on followup of issues and needs? Are you willing to participate on ad hoc committees to work on issues and needs?

Sure, I could put some time into ad hoc committe However, at our station all meetings and extra duties are paid for from my research operating budget. I would hope that such trips could be paid for by the W.O. seems like a small thing but most other units pay for the PUC activities from Legion or station funds.

3. Did this meeting broaden your perspective and vision of your job as a pesticide coordinator?

yes, However I would like a description of what a PUC is expected to do, a job description if you will.

4. What training do you need to assist you in performing your pesticide coordinator duties? e.g. risk assessment, GLP, and risk/benefit communications.

I need GLP training !!

5. How frequently do you believe this meeting should be held? What month of the year?

Once a year. Hold during the winter months October is too early, still in the field season I would suggest a Feb or March time-frame.

6. Did you find the facilities to be adequate? Suggestions??

Facilities were excellent. The room used the last day ~~was~~ was not good but the meeting organizers know about that.

7. Any additional comments:

Walter C. Ihrig — NAME

PNW Research Sta — ORGANIZATION

(503) 750-7408 — PHONE NUMBER

CRITIQUE OF NATIONAL PESTICIDE COORDINATORS MEETING

Salt Lake City, UT
September 29 - October 2, 1992

1. Did this meeting meet your needs and expectations?

If YES - H O W ? ? If NO - W H Y ? ? BE SPECIFIC!!

Yes
Meet people, make contacts doing similar work
Hear applied problems
Develop ideas for future work

2. What are your expectations on followup of issues and needs? Are you willing to participate on ad hoc committees to work on issues and needs?

I need to distribute some ideas to address problems. I can participate on committees.

3. Did this meeting broaden your perspective and vision of your job as a pesticide coordinator?

N/A

(Gave me a perspective as to what pc s are up against)

4. What training do you need to assist you in performing your pesticide coordinator duties? e.g. risk assessment, GLP, and risk/benefit communications.

N/A

I am familiar with r/a and could help with r/b strategies. I need to study GLP. It is currently an issue with our contractors.

5. How frequently do you believe this meeting should be held? What month of the year?

Yearly
anytime

6. Did you find the facilities to be adequate? Suggestions??

Bad neighborhood.

7. Any additional comments:

I would let people choose the work group topics they want to work on. Members could be reassigned from popular to unpopular groups. (25% could be randomly reassigned if necessary to achieve a mix.) The problem is that people discuss problems that are important to them, no matter what the assignment

Harold Thistle	MTDC	406-329-3981
NAME	ORGANIZATION	PHONE NUMBER

Leon LaMadeleine

CRITIQUE OF NATIONAL PESTICIDE COORDINATORS MEETING

Salt Lake City, UT
September 29 - October 2, 1992

1. Did this meeting meet your needs and expectations?

If YES - H O W ? ? If NO - W H Y ? ? BE SPECIFIC!!

Yes - Wanted an overview of issues, technology, needs, etc + wanted to contribute to work groups. Was able to do so.

2. What are your expectations on followup of issues and needs? Are you willing to participate on ad hoc committees to work on issues and needs?

Yes. Information, public affairs, education, etc.
Expectations - NO keep the ball rolling, set some goals, get mindset, + contribute. Don't just throw to Regions

3. Did this meeting broaden your perspective and vision of your job as a pesticide coordinator?

NA I'm not a pesticide coordinator.

4. What training do you need to assist you in performing your pesticide coordinator duties? e.g. risk assessment, GLP, and risk/benefit communications.

Risk assessment for the manager.

5. How frequently do you believe this meeting should be held? What month of the year?

Every 2 yrs. Jan/Feb.

6. Did you find the facilities to be adequate? Suggestions??

Yes. Breakout rooms good.

7. Any additional comments:

Time for "brainstorming", etc. very inadequate.

Teresa F. Madeline

NAME

USDA - FS
R-4, FPM
4746 S. 1900 E.

ORGANIZATION

Ogden, UT 84403

801 - 476-9728

PHONE NUMBER

CRITIQUE OF NATIONAL PESTICIDE COORDINATORS MEETING

Salt Lake City, UT
September 29 - October 2, 1992

1. Did this meeting meet your needs and expectations?

If YES - H O W ? ? If NO - W H Y ? ? BE SPECIFIC!!

I did not have any specific expectations but I did have an important need to meet the other Pesticide coordinators. This meeting provided that and also gave me some insight into the current and future situations. The technical presentations were very good though more of the speakers should have provided hard-copy of their notes. The time spent on developing a strategic plan was important but it was hard to concentrate on specific tasks with so little time. The combination of a technical meeting and strategy was good as it gave a change of pace but I do think that most felt we did not have sufficient time to develop the future strategy.

2. What are your expectations on followup of issues and needs? Are you willing to participate on ad hoc committees to work on issues and needs?

I would be willing to participate on an ad hoc committee. I think the most important issue that needs a lot of follow-up is the strategic plan. Many other important ideas, objectives and strategies may arise after this meeting that did not come up during the short time frame. Further review and additions of ideas should be encouraged and it should be made clear that the work done at the meeting was good but it was not complete.

3. Did this meeting broaden your perspective and vision of your job as a pesticide coordinator?

Yes, it gave me a broad perspective of the opportunities in my position in NA. Pesticide application and tools are important parts of ecosystem management and restoration.

4. What training do you need to assist you in performing your pesticide coordinator duties? e.g. risk assessment, GLP, and risk/benefit communications. In Region 9 there is very little use of herbicides but I feel that will change with ecosystem mgt Risk assessment and Hazmat training would be beneficial. I am also planning to take a course in informed consent.

5. How frequently do you believe this meeting should be held? What month of the year? Once a year in late winter - Jan - March.

6. Did you find the facilities to be adequate? Suggestions??
The facilities were very good.

7. Any additional comments:
I feel that the meeting has been very good and that you have done a good juggling act of strategy planning and technical presentation. The facilitator was excellent and greatly affected the amount of work accomplished in such a short period of time. I do think that the next meeting should be in Jan-Mar 93 as a follow-up on this strategy building. Future technical sessions should start to move towards Ecosystems and our ~~impacts~~ responsibilities and part in management with the National Forest Systems & other agencies.

Russell A McKinney	NA - FHP	(415) 297-3257
NAME	ORGANIZATION	PHONE NUMBER

CRITIQUE OF NATIONAL PESTICIDE COORDINATORS MEETING

Salt Lake City, UT
September 29 - October 2, 1992

1. Did this meeting meet your needs and expectations?

If YES - H O W ? ? If NO - W H Y ? ? BE SPECIFIC!!

YES - Enjoyed & profited by working group sessions

NO - NOT ENOUGH (NONE) TIME DEVOTED TO REGIONAL RPTS. & INPUTS

NO — NO TIME FOR BITCH-SESSIONS, VENTING FRUSTRATIONS - THIS IS NEEDED TO ENSURE COMMUNICATIONS & REDUCE TENSION — MUCH OF THIS WAS DONE IN THE WORK GROUP MEETINGS — THIS HELPED BUT REDUCED EFFECTIVENESS OF WORK GROUP MEETINGS

2. What are your expectations on followup of issues and needs? Are you willing to participate on ad hoc committees to work on issues and needs?

I would like to see a resumé (summary) of all the Critiques & "see" how some of these "issues" will be dealt with.
"Timely Tips" will be re-instated
I could help -

3. Did this meeting broaden your perspective and vision of your job as a pesticide coordinator?

Yes — through discussions within Work Group Meetings.

- Realize that all FPM units should/must have a P.A.O. STAFF PERSON!!

4. What training do you need to assist you in performing your pesticide coordinator duties? e.g. risk assessment, GLP, and risk/benefit communications.

More communication skills – dealing with "publics"

5. How frequently do you believe this meeting should be held? What month of the year?

Should be held annually in fall or early winter

"Strategic planning" should be / should have been dealt in a separate meeting

6. Did you find the facilities to be adequate? Suggestions??

Facilities good

7. Any additional comments:

Moderators did a good job

More "active" breaks needed

Need more time – the evening sessions.

Reduce the amount of "general" talks – ie. weed problems etc.

Increase time spent on specific issues/problem areas - Ed Holster R10 FPM 907-271-2575

NAME ORGANIZATION PHONE NUMBER

E. Holsten: R10FM4

At first was P.O'd that we were developing Strat. Plan – something I thought W.O. is paid (?) to do (Knee-jerk) However realized not core Program item, important

CRITIQUE OF NATIONAL PESTICIDE COORDINATORS MEETING

Salt Lake City, UT
September 29 - October 2, 1992

1. Did this meeting meet your needs and expectations?

If YES - H O W ? ? If NO - W H Y ? ? BE SPECIFIC!!

This was my first such meeting & could not define any specific expectations.

2. What are your expectations on followup of issues and needs? Are you willing to participate on ad hoc committees to work on issues and needs?

I would hope that the issues that have been identified will be acted upon. Since I'm not a pesticide coordinator and am affiliated w/ FIFRA rather than FQPA I don't know what committees I would best fit in - but given that there is a need of input from research I would be willing to participate on an ad hoc committee

3. Did this meeting broaden your perspective and vision of your job as a pesticide coordinator?

I'm not a pesticide coordinator

4. What training do you need to assist you in performing your pesticide coordinator duties? e.g. risk assessment, GLP, and risk/benefit communications.

N A

5. How frequently do you believe this meeting should be held? What month of the year?

You should perhaps hold this meeting every 2 years to provide sufficient time to evaluate progress to date as well as provide more time for formal speaker presentations.

6. Did you find the facilities to be adequate? Suggestions??

Yes generally the facilities were adequate I would suggest however that more time be allowed for speakers and that they be provided with guidelines as to what they are expected to discuss ie background, current work, near future developments

7. Any additional comments:

I found the panel need to discuss a PUMA program very informative

Raymond R Beeson NEFES FIDR (203) 773-2026

NAME ORGANIZATION PHONE NUMBER

Ralph E. Williams

CRITIQUE OF NATIONAL PESTICIDE COORDINATORS MEETING FPM-R-4

Salt Lake City, UT
September 29 - October 2, 1992

Boise, Id

1. Did this meeting meet your needs and expectations?

If YES - H O W ? ? If NO - W H Y ? ? BE SPECIFIC!!

I think so. Informational sessions/presentations timely & professional. Meeting well organized. Very impressed with the facilitator and outputs derived from the process.

2. What are your expectations on followup of issues and needs? Are you willing to participate on ad hoc committees to work on issues and needs?

I see 4-5 major items/thrusts developed & direction for PMEC. Would like to see further consideration/development and an action plan put together/implemented. I think the message is loud and clear. Let's get the "train" rolling. Yes. I'd be willing to participate further.

3. Did this meeting broaden your perspective and vision of your job as a pesticide coordinator?

I'm not a pesticide coordinator, but I enjoy pesticide related considerations. Am quite familiar with various aspects of pesticide usage/coordination. But aspects concerning noxious weeds and their capability of completely changing ecosystem functioning in a "normal" manner & on a permanent basis are becoming increasingly obvious and of great concern

4. What training do you need to assist you in performing your pesticide coordinator duties? e.g. risk assessment, GLP, and risk/benefit communications.

N/A for the most part.
Would like training re pesticide effects & ecology

5. How frequently do you believe this meeting should be held? What month of the year?

Annually — Spring or Fall - perhaps a field trip could be more frequently involved

6. Did you find the facilities to be adequate? Suggestions??

Generally - yes

7. Any additional comments:

Need more emphasis re bio controls

Kaye Williams — NAME
EPA — ORGANIZATION
208-364-4227 — PHONE NUMBER

CRITIQUE OF NATIONAL PESTICIDE COORDINATORS MEETING

Salt Lake City, UT
September 29 - October 2, 1992

1. Did this meeting meet your needs and expectations?

If YES - H O W ? ? If NO - W H Y ? ? BE SPECIFIC!!

N/A - I did not have any specific expectations. I got some useful information, made some good contacts, and learned about both FS pesticide use issues & grap dynamics. My direct involvement with use and management of pesticides is very minimal, so I did not arrive with pre-formed expectations, nor with any pressing needs.

2. What are your expectations on followup of issues and needs? Are you willing to participate on ad hoc committees to work on issues and needs?

Again, my expectations are nebulars, as I have very few specific needs nor pressing issues related to my role as the Pesticide Use Coordinator for the Rocky Mountain Station.

I do not think I'm a good choice for an ad hoc committee member, as I do not have expertise nor a "stake" in this area.

3. Did this meeting broaden your perspective and vision of your job as a pesticide coordinator?

It broadened my knowledge of current issues in pesticide use on FS lands. Scientists at the Rocky Mountain station are doing next to no work with pesticides, so I do not think it broadened my perspective of my role as pesticide coordinator.

4. What training do you need to assist you in performing your pesticide coordinator duties? e.g. risk assessment, GLP, and risk/benefit communications.

I need little or no training, as we do little or no work that involves pesticides.

5. How frequently do you believe this meeting should be held? What month of the year?

From my perspective, every 2-3 years would be fine. No strong opinion on a month - Fall or winter are probably best.

6. Did you find the facilities to be adequate? Suggestions??

Yes No

7. Any additional comments:

Karen Clancy
NAME

FS Research - Rocky Mtn. Stn.
ORGANIZATION

602-556-7315
PHONE NUMBER

CRITIQUE OF NATIONAL PESTICIDE COORDINATORS MEETING

Salt Lake City, UT
September 29 - October 2, 1992

1. Did this meeting meet your needs and expectations?

If YES - H O W ? ? If NO - W H Y ? ? BE SPECIFIC!!

YES -- THE MEETING WAS BENEFICIAL IN POINTING OUT FRUSTRATIONS, CONCERNS, & NEEDS. IT PROVIDED A GOOD PROCESS TO BEGIN TO DEVELOP A MUCH NEEDED "STRATEGIC PLAN" & TO BEGIN TO REPAIR A BROKEN LINE OF COMMUNICATION & INFORMATION EXCHANGE FROM THE FIELD TO THE WO & BACK AGAIN.
THIS WAS A DEVIATION FROM EXPECTED "INFORMATIONAL" MEETINGS OF THE PAST. SO IN THAT RESPECT, THIS SHOULD HAVE BEEN TWO SEPARATE MEETINGS.

2. What are your expectations on followup of issues and needs? Are you willing to participate on ad hoc committees to work on issues and needs?

I EXPECT TO SEE A USEFUL STRATEGIC PLAN FOR PUMAC THAT REFLECTS THE INPUT & RECOMMENDATIONS FROM THIS EXERCIZE.

YES, I AM WILLING TO WORK FURTHER ON THESE ISSUES.

3. Did this meeting broaden your perspective and vision of your job as a pesticide coordinator?

YES

4. What training do you need to assist you in performing your pesticide coordinator duties? e.g. risk assessment, GLP, and risk/benefit communications.

I NEED R-3 TO SUPPORT A SEPARATE PESTICIDE COORDINATOR POSITION! I DON'T HAVE THE TIME OR TRAINING TO ADEQUATELY ADDRESS THIS IMPORTANT SUBJECT AS AN "ADD ON" RESPONSIBILITY.

5. How frequently do you believe this meeting should be held? What month of the year?

ANNUALLY

6. Did you find the facilities to be adequate? Suggestions??

YES, UNTIL THE LAST DAY.

7. Any additional comments:

THIS STRATEGIC PLANNING EFFORT WAS MUCH NEEDED & A WORTHWHILE PROCESS!

NAME	ORGANIZATION	PHONE NUMBER
Dyke Bennett	R-3 FRM	(505) 842-3190

CRITIQUE OF NATIONAL PESTICIDE COORDINATORS MEETING

Salt Lake City, UT
September 29 - October 2, 1992

1. Did this meeting meet your needs and expectations?

If YES - H O W ? ? If NO - W H Y ? ? BE SPECIFIC!!

No - Originally this meeting was to follow previous format of regional reports & encouraging interaction. It became about ½ facilitated Mission/Strategic planning meeting. Neither need was filled adequately. These should have been 2 separate week long (3 day) meetings. Future publication of regional/station reports will help - but spoken/interactive reports are far more effective

2. What are your expectations on followup of issues and needs? Are you willing to participate on ad hoc committees to work on issues and needs?

~~Probably~~ will see a Strategic Plan, but I am unsure of what to expect from herbicide/Veg. manage. input. Came to the meeting feeling that veg. manage. is FPM's bastard stepchild - and have not been convinced otherwise. No evidence that FPM will become proactive in this arena.

I will work on ad hoc committees if needed -

3. Did this meeting broaden your perspective and vision of your job as a pesticide coordinator? Some good input but overall impression

No - it made me more fearful for the program - We have good people throughout the system - but they are functioning essentially in a reactive mode. We have superb NEPA documents but there is a perception among many of us (justified?) that there is no support for the program at top levels (above FPM!) in the F.S. & that lack of support will cost us. ~~For all this I have come~~

4. What training do you need to assist you in performing your pesticide coordinator duties? e.g. risk assessment, GLP, and risk/benefit communications.

GLP ? don't know what level needed - but need this.

NEPA update/implications

Chemical/pesticide training to keep me current.

5. How frequently do you believe this meeting should be held? What month of the year?

Annually — Winter (less likely to conflict?
end of January — end of Feb.

6. Did you find the facilities to be adequate? Suggestions??

yes

7. Any additional comments:

Reestablish SS&TT.

Need W.O. direction → are we pesticide advocates or are we to be shutting down?

Good handouts from Edenka — possible to make an ongoing process? Easier by ones than by 10's.

Should have started Tuesday where we ended on Thursday! Begin process with problems/needs
Achievements — & BUILD!

Paul L Mistretta	FPM/R-8 Atlanta	(404) 347-2961
NAME	ORGANIZATION	PHONE NUMBER

CRITIQUE OF NATIONAL PESTICIDE COORDINATORS MEETING

Salt Lake City, UT
September 29 - October 2, 1992

1. Did this meeting meet your needs and expectations?

If YES - H O W ? ? If NO - W H Y ? ? BE SPECIFIC!!

I PROBABLY HAD MORE VAGUE EXPECTATIONS THAN SOME OF THE "OLD-TIMERS" IN THE GROUP; MY MAIN OBJECTIVES WERE TO GET TO KNOW THE GROUP, AND THE PROBLEMS EXPERIENCED IN OTHER REGIONS/AREAS. THESE WERE WELL MET. I ALSO GOT A LOT FROM THE FEEDBACK IN THE LAST HOUR.

2. What are your expectations on followup of issues and needs? Are you willing to participate on ad hoc committees to work on issues and needs?

I THINK WE NEED FOLLOWUP IN A FAIRLY SHORT TIME FRAME. I WILL BE HAPPY TO SERVE IF MY EXPERIENCE AND ABILITY WILL BE OF USE.

3. Did this meeting broaden your perspective and vision of your job as a pesticide coordinator?

YES.

4. What training do you need to assist you in performing your pesticide coordinator duties? e.g. risk assessment, GLP, and risk/benefit communications.

I COULD USE TRAINING IN GLP AND GENERAL RISK ASSESMENT; I HAVE BACKGROUND IN EA WORK, BUT NOT FULL ETS. I HOPE TO PICK THIS UP, POSSIBLY BY OJT SOMEWHERE.

5. How frequently do you believe this meeting should be held? What month of the year?

ANNUALLY, AT A TIME WHEN OUR MAJOR PROGRAM ACTIVITIES ARE AT A LOW EBB. FOR ME, FEB - MARCH WOULD BE GOOD,

6. Did you find the facilities to be adequate? Suggestions??

NO PROBLEMS AT ALL.

7. Any additional comments:

WE NEED TO ENCOURAGE MORE PORTICIPATION BY FOREST LEVEL PERSONNEL. I ENJOYED THE MEETING, AND FELT THAT I LEARNED A LOT FROM PROCESS AND INTERACTION AS WELL AS FROM INFORMATIONAL SESSIONS. I WAS PARTICULARLY GLAD TO SEE WO STAFF WILLING TO LISTEN TO PROBLEMS/GRIPES AND OPEN TO PROGRESS.

JIM BROWN	R-8 RO FPM	404-347-2961
NAME	ORGANIZATION	PHONE NUMBER

CRITIQUE OF NATIONAL PESTICIDE COORDINATORS MEETING

Salt Lake City, UT
September 29 - October 2, 1992

1. Did this meeting meet your needs and expectations?

If YES - H O W ? ? If NO - W H Y ? ? BE SPECIFIC!!

Yes - provided opportunity for input to strategic plan & future direction of PUM&C.

2. What are your expectations on followup of issues and needs? Are you willing to participate on ad hoc committees to work on issues and needs?

That they will be addressed, possibly through follow up meetings. Yes - willing to work on committee.

3. Did this meeting broaden your perspective and vision of your job as a pesticide coordinator?

N/A - not a pesticide coordinator but gave me a better understanding of PC's job.

4. What training do you need to assist you in performing your pesticide coordinator duties? e.g. risk assessment, GLP, and risk/benefit communications.

N/A

5. How frequently do you believe this meeting should be held? What month of the year?

Heard a lot of discussion & support for an annual meeting.

6. Did you find the facilities to be adequate? Suggestions??

Excellent — except for last day - room set up too crowded.

7. Any additional comments:

Pat Akyler — NAME
WQ/FPM/Davis — ORGANIZATION
916-551-1715 — PHONE NUMBER

CRITIQUE OF NATIONAL PESTICIDE COORDINATORS MEETING

Salt Lake City, UT
September 29 - October 2, 1992

1. Did this meeting meet your needs and expectations?

If YES - H O W ? ? If NO - W H Y ? ? BE SPECIFIC!!

No - There were two meetings ① Strategic Planning & ② the normal PARC meeting of info exchange and problem identification and problem solving. I think the Strategic Planning meeting was too rushed -- it in turn cut off discussion during info exchange where issues were being identified that needed action by WO or someone in the field.

2. What are your expectations on followup of issues and needs? Are you willing to participate on ad hoc committees to work on issues and needs?

I don't think issues were really articulated. Conversation and discussion was cut off too soon. I am willing to work on issues & needs, but I think a committee would do well to get information from the field to ensure something isn't missed.

3. Did this meeting broaden your perspective and vision of your job as a pesticide coordinator?

No

4. What training do you need to assist you in performing your pesticide coordinator duties? e.g. risk assessment, GLP, and risk/benefit communications.

N/A

5. How frequently do you believe this meeting should be held? What month of the year?

Yearly

6. Did you find the facilities to be adequate? Suggestions??

OK except the last day !, Ballroom

7. Any additional comments:

Neisess — NAME

R-5 — ORGANIZATION

(415) 705-2567 — PHONE NUMBER

CRITIQUE OF NATIONAL PESTICIDE COORDINATORS MEETING

Salt Lake City, UT
September 29 - October 2, 1992

1. Did this meeting meet your needs and expectations?

If YES - H O W ? ? If NO - W H Y ? ? BE SPECIFIC!!

It met my expectations but not my needs. We need more information on Proper Pesticide-use, management + coordination.

The information flow does not work in getting this information to the customer (Forests + Regions)

2. What are your expectations on followup of issues and needs? Are you willing to participate on ad hoc committees to work on issues and needs?

I would like to see written follow-up of the issues + needs identified at this meeting. (Some of the issues + needs are more valad than others.) I would be willing to Particpate on ad hoc committees dealing with vegetation management.

3. Did this meeting broaden your perspective and vision of your job as a pesticide coordinator?

Yes - It is good to have information on Pesticide use beyond insect + disease + Site Prep + release

4. What training do you need to assist you in performing your pesticide coordinator duties? e.g. risk assessment, GLP, and risk/benefit communications.

Need Very "basic" GLP Training
I need basic training on pesticides used in Insect disease
Animal damage control- Fish Control, Predator control
Range management

5. How frequently do you believe this meeting should be held? What month of the year?

1 year in winter

6. Did you find the facilities to be adequate? Suggestions??

Very good

7. Any additional comments:

Garth Baxter	R-4	801-625-5258
NAME	ORGANIZATION	PHONE NUMBER

CRITIQUE OF NATIONAL PESTICIDE COORDINATORS MEETING

Salt Lake City, UT
September 29 - October 2, 1992

1. Did this meeting meet your needs and expectations?

If YES - H O W ? ? If NO - W H Y ? ? BE SPECIFIC!!

Yes and No!

Yes, it met my needs to communicate and maintain personal relationships with other members of the group.

No. After reviewing the AGENDA, it did not meet the expectations

2. What are your expectations on followup of issues and needs? Are you willing to participate on ad hoc committees to work on issues and needs?

I expect to be having more frequent meeting (each year). I expect that strategic plan, when finalized, will address the main issues.

Yes, I am willing to participate

3. Did this meeting broaden your perspective and vision of your job as a pesticide coordinator?

No, but it made me think the necessity to narrow our perspective.

4. What training do you need to assist you in performing your pesticide coordinator duties? e.g. risk assessment, GLP, and risk/benefit communications.

Not Sure -

Strategic Planning -

Risk Communications

5. How frequently do you believe this meeting should be held? What month of the year? at least one time each year. September/October

6. Did you find the facilities to be adequate? Suggestions??

More than - They were excellent.

7. Any additional comments:

Not At this time

CHARLES HATCH — NAME

NA - — ORGANIZATION

215.975.4126 — PHONE NUMBER

CRITIQUE OF NATIONAL PESTICIDE COORDINATORS MEETING

Salt Lake City, UT
September 29 - October 2, 1992

1. Did this meeting meet your needs and expectations?

If YES - H O W ? ? If NO - W H Y ? ? BE SPECIFIC!!

yes, in that there was atleast a meeting where we could get together.

no, in that there was insufficient time for regional program discussion at the level we need.

-We need more time for informal discussions & projects, problems & concerns.

2. What are your expectations on followup of issues and needs? Are you willing to participate on ad hoc committees to work on issues and needs?

1. WO leadership - esp. the Director will take meaningful steps to re-establish the credibility of W.O/WO staff as leaders in FPM nationwide. There is ~~a stro~~ an unfortunate perception that the present W.O. staff cannot perform at the level necessary to be effective.
2. There will be an absolute committment by W.O. to insure that annual meetings & the Pesticide coordinators from the "Field".
3. Communications, especially the restart of a regular Newsletter will be paid more attention.
4. I will participate willingly on ad hoc committees.

3. Did this meeting broaden your perspective and vision of your job as a pesticide coordinator?

Yes- I was especially appreciative of the portions on noxious weeds and animal damage control.

4. What training do you need to assist you in performing your pesticide coordinator duties? e.g. risk assessment, GLP, and risk/benefit communications.

GLP field study implementation
Latest NEPA/FIFRA, TSCA ING

5. How frequently do you believe this meeting should be held? What month of the year?

Annually - October - Nov., but NOT in the one week when the 2 FYs occur!

6. Did you find the facilities to be adequate? Suggestions??

Facilities were adequate need to move South or East For 1993.

7. Any additional comments:

Make more time for specific topics - we spent a lot of time on the strategic planning which while important, should probably have been a separate meeting topic

John Taylor
NAME

R8/FPM
ORGANIZATION

(404) 347-2961
PHONE NUMBER

CRITIQUE OF NATIONAL PESTICIDE COORDINATORS MEETING

Salt Lake City, UT
September 29 - October 2, 1992

1. Did this meeting meet your needs and expectations?

If YES - H O W ? ? If NO - W H Y ? ? BE SPECIFIC!!

yes
I hope that the decisions will be kept alive.

2. What are your expectations on followup of issues and needs? Are you willing to participate on ad hoc committees to work on issues and needs?

- Probably only part of the issues & needs will be discussed and followed later
- If necessary I will.

3. Did this meeting broaden your perspective and vision of your job as a pesticide coordinator?

yes.

4. What training do you need to assist you in performing your pesticide coordinator duties? e.g. risk assessment, GLP, and risk/benefit communications.

to keep up with Risk Assessment, Management & Communication

- GLPs
- new toxicology fields as neuro, immuno, etc
- pesticide toxicology

5. How frequently do you believe this meeting should be held? What month of the year?

a) EVERY YEAR

b) FALL OR EARLY SPRING

c) the participants should stay through whole meeting

6. Did you find the facilities to be adequate? Suggestions??

yes

7. Any additional comments:

- not enough time to discuss properly the tasks at Work group Meetings
- Plan some time for non organized "~~time~~ discussions. New ideas come out.

Z. HORAKOVA	WO - FPM	202-205 1600
NAME	ORGANIZATION	PHONE NUMBER

CRITIQUE OF NATIONAL PESTICIDE COORDINATORS MEETING

Salt Lake City, UT
September 29 - October 2, 1992

1. Did this meeting meet your needs and expectations?

If YES - H O W ? ? If NO - W H Y ? ? BE SPECIFIC!!

Yes. Being in the Nursery & Sod Orchard EIS Team I was outside the normal info loop for a lot of pesticide info. So all the info shared was very informative. As for my expectations .... I honestly had none. I found out about the meeting 4 days before it occurred. I was both able to find a copy of the agenda but also develop expectations.

2. What are your expectations on followup of issues and needs? Are you willing to participate on ad hoc committees to work on issues and needs?

I expect that to one degree or another the group which I am in (Communication/Public relations) will continue to provide input towards the development of a strategic plan. My guess would be that we'll end up serving as a review committee for that portion of the plan. Hopefully we can do more than just review as this is but that we didn't have due to a lack of time.

Yes, I would be willing to participate in an ad hoc committee. Hopefully whatever needs to be done can be done via E-Mail or correspondence because it is a real problem to get together. Considering the cutbacks which may be occurring this year.

3. Did this meeting broaden your perspective and vision of your job as a pesticide coordinator?

I'm not a pesticide coordinator so I can't answer from that perspective. However I can say that the technology transfer that occurred, particularly in the area of biological treatment was enlightening. I was particularly impressed with the presentation on weed management by Ted Bruns. It had me rethinking certain facets of this specific weed could do what they do so efficiently.

4. What training do you need to assist you in performing your pesticide coordinator duties? e.g. risk assessment, GLP, and risk/benefit communications.

Not Applicable

5. How frequently do you believe this meeting should be held? What month of the year?

It seemed apparent to me that the group presently has enough problems and issues that may warrant a meeting next summer or fall. However given the situation of dealing budget / personnel etc. I think that it might be wise to try & do some of these things as an ongoing affair over the DC & thru newsletters.

6. Did you find the facilities to be adequate? Suggestions??

The first room we were in was excellent. The small room on the final day was not adequate or not arranged properly for a group of our size. Get a better handle (before hand) on the number of attendees so that seating can be set up to best accomodate the group. The 1st room was nice..... but we really had too much space.

7. Any additional comments:

I thought that some of the critiques levied on the D.O were not really appropriate. Like I said earlier I feel I expect to be involved in the preparation or review of the Strategic Plan. I never expected that a plan could really be completed in 3 days. One aspect of the Vision statement that I'd disagree with was the word Federal in the phrase that the Forest Service provides for itself. I guess I feel we should get our own house in order before we start advising other people on how to manage their situation.

Dennis J. Welter — USFS - R-6 — (503) 326-7111

NAME — ORGANIZATION — PHONE NUMBER

CRITIQUE OF NATIONAL PESTICIDE COORDINATIORS MEETING

Salt Lake City, UT
September 29 - October 2, 1992

1. Did this meeting meet your needs and expectations?

If YES - H O W ? ? If NO - W H Y ? ? BE SPECIFIC!!

I really didn't have any expectations, because it was my first meeting and I did not know what to expect. I found it informative on a number of topics such as biological control of weeds, GLP, NAPIAP, risk assessment, and pesticide role in ecosystem management. Unfortunately I missed most of the Wednesday session because of illness. I enjoyed meeting the people from FPM - WO and Regions as well as people from other stations. The fascilitated session on PUM&C was very good and useful. I was glad to have input and I think the strategic plan will be very useful to FPM & FIDR.

2. What are your expectations on followup of issues and needs? Are you willing to participate on ad hoc committees to work on issues and needs?

I expect to see the next draft of the PUM&C Strategic Plan? Also I am looking forward to the Proceedings and especially the PC reports. I would be glad to help if I can.

3. Did this meeting broaden your perspective and vision of your job as a pesticide coordinator?

I am an acting PC for this meeting so I don't have the job. I have a better appreciation of the job the PC's have in FPM field offices. I would like to know just what is expected of PC in Stations. I know they vary among stations. I guess the PC reports might give me some info on this.

4. What training do you need to assist you in performing your pesticide coordinator duties? e.g. risk assessment, GLP, and risk/benefit communications.

If I had the job training in the above areas, would be useful.

5. How frequently do you believe this meeting should be held? What month of the year?

I'd say annually or every other year - no longer. I'd say October - November might be better - after field season.

6. Did you find the facilities to be adequate? Suggestions??

Yes.

7. Any additional comments:

It was enjoyable and educational. The field trip was very informative and enjoyable.

JOHN C. NORD // Jack/ | Forestry Sciences Lab, SE-4501 | 706-546-2467
NAME | ORGANIZATION | PHONE NUMBER

GOOD LABORATORY PRACTICES

GLP

GENERAL REQUIREMENTS

- FACILITIES MUST BE ADEQUATE
- PERSONNEL MUST BE QUALIFIED
- TEST FACILITY MUST HAVE A QUALITY ASSURANCE UNIT INDEPENDENT OF STUDY DIRECTION
- LABORATORY OPERATIONS MUST HAVE STANDARD OPERATING PROCEDURES (SOPs)
- RECORDS MUST BE MAINTAINED
- EQUIPMENT MUST BE CALIBRATED AND MAINTAINED
- EACH STUDY MUST HAVE A STUDY DIRECTOR
- TEST SUBSTANCES AND ANALYTICAL STANDARDS MUST BE PROPERLY HANDLED AND CHARACTERIZED
- EACH STUDY MUST HAVE A PROTOCOL
- A FINAL REPORT MUST BE PREPARED
- DATA AND SAMPLES MUST BE SECURELY ARCHIVED

STUDY DIRECTOR

THERE CAN BE ONLY ONE STUDY DIRECTOR WHO WILL HAVE OVERALL RESPONSIBILITY FOR THE MANAGEMENT, CONDUCT, AND REPORTING OF THE STUDY.

A STUDY IS DEFINED AS ENCOMPASSING A GUIDELINE REQUIREMENT WHICH WILL INCLUDE BOTH FIELD AND ANALYTICAL SECTIONS.

UNDER THIS CONCEPT, THE STUDY DIRECTOR MAY DELEGATE RESPONSIBILITY FOR A PORTION (I.E., FIELD OR LABORATORY) OF THE STUDY CONDUCT AND QA FUNCTION TO A THIRD PARTY.

THERE CAN BE ONLY 1 PROTOCOL AND 1 REPORT WITH 1 OR MORE COMPLIANCE STATEMENTS WHICH MUST BE IDENTICAL IN CONTENT.

QUALITY ASSURANCE UNIT

- TESTING FACILITY MUST HAVE A QAU
- QAU MUST BE SEPARATE AND INDEPENDENT OF STUDY CONDUCT
- GLP REQUIRED DUTIES:
  1. MAINTAINS COPY OF MASTER SCHEDULE OF ALL STUDIES CONDUCTED
  2. MAINTAINS COPY OF THE PROTOCOL FOR EACH STUDY
  3. PERIODICALLY INSPECTS EACH STUDY AND PREPARES REPORTS TO MANAGEMENT AND STUDY DIRECTOR
  4. IMMEDIATELY INFORMS STUDY DIRECTOR AND MANAGEMENT IN WRITING OF STUDY PROBLEMS
  5. AUDITS FINAL REPORT AGAINST SUPPORTING RAW DATA
  6. ASSURES NO DEVIATIONS FROM PROTOCOL OR SOPs WERE MADE WITHOUT PROPER AUTHORIZATION AND DOCUMENTATION
  7. PREPARES QA STATEMENT FOR INCLUSION IN FINAL REPORT
  8. CONDUCTS PERIODIC FACILITY INSPECTIONS
- OTHER QAU DUTIES:
  1. INTERACTS POSITIVELY WITH TECHNICAL PERSONNEL
  2. INTERACTS WITH EPA INSPECTORS AND CLIENTS
  3. REVIEWS AND MAINTAINS COPIES OF SOPs
  4. PROOF READS AND EDITS REPORTS
  5. MAINTAINS ARCHIVES
  6. REVIEWS PROTOCOLS FOR COMPLIANCE WITH TEST GUIDELINES, STANDARD EVALUATION PROCEDURES, AND ACCEPTANCE CRITERIA

STANDARD OPERATING PROCEDURES

- SOPs SHOULD BE DEVELOPED FOR COMMON REPETITIVE TASKS
- MUST BE APPROVED BY TESTING FACILITY MANAGEMENT
- MANUAL MUST CONTAIN TABLE OF CONTENTS AND THE FOLLOWING CHAPTERS:

  ADMINISTRATIVE/ORGANIZATIONAL
  HEALTH AND SAFETY
  QUALITY ASSURANCE UNIT
  DOCUMENTATION AND RECORD KEEPING
  TEST SUBSTANCE AND ANALYTICAL STANDARDS MANAGEMENT
  EQUIPMENT/INSTRUMENTS - USE, MAINTENANCE & CALIBRATION
  REPORTS
  ARCHIVES
  LABORATORY PROCEDURES
  FIELD PROCEDURES

- INDIVIDUAL SOPs MUST CONTAIN:

  TITLE AND PURPOSE
  PROCEDURE PRESENTED IN OUTLINE FORM
  DEFINITIONS, MATERIALS, CALCULATIONS
  DATA COLLECTION FORMS
  REFERENCES TO PUBLISHED LITERATURE
  EFFECTIVE DATE AND MANAGEMENT SIGNATURE

PROTOCOL PREPARATION

PROTOCOLS MUST BE DEVELOPED TO DESIGN SCIENTIFICALLY VALID STUDIES. USE THE PESTICIDE ASSESSMENT GUIDELINES, THE STANDARD EVALUATION PROCEDURES, THE DATA REPORTING GUIDELINES, AND THE GLPs.

EACH STUDY MUST HAVE A WRITTEN PROTOCOL APPROVED BY THE STUDY DIRECTOR AND SPONSOR PRIOR TO THE EXPERIMENTAL START DATE.

THE PROTOCOL MUST INCLUDE:

- DESCRIPTIVE TITLE, STATEMENT OF PURPOSE OF STUDY
- DATE OF APPROVAL BY THE STUDY DIRECTOR AND SPONSOR
- PROPOSED EXPERIMENTAL START AND TERMINATION DATES
- NAME AND ADDRESS OF SPONSOR AND TESTING FACILITY/TEST SITES
- IDENTIFICATION OF TEST SUBSTANCE AND ANALYTICAL REFERENCE STANDARDS
- JUSTIFICATION FOR THE SELECTION OF TEST SYSTEM
- TEST SYSTEM IDENTIFICATION AND DESCRIPTION
- EXPERIMENTAL DESIGN
- IDENTIFICATION OF DIET, SOLVENTS, EMULSIFIERS, ETC., USED WITH THE TEST SUBSTANCE
- ROUTE OF ADMINISTRATION AND REASON FOR CHOICE
- DOSAGE LEVELS
- FREQUENCY OF TESTS, ANALYSES AND MEASUREMENTS
- STATISTICAL METHODS TO BE USED
- RECORDS TO BE MAINTAINED

PROTOCOL AMENDMENT: ANY PLANNED CHANGE TO THE STUDY DESIGN

PROTOCOL DEVIATION: ANY UNPLANNED CHANGE TO THE STUDY DESIGN

BOTH MUST BE DOCUMENTED WITH STUDY DIRECTOR'S SIGNATURE AND DATE, AND MAINTAINED WITH THE PROTOCOL

TEST CHEMICAL AND ANALYTICAL STANDARD CHARACTERIZATION

1. SEPARATE AREAS MUST BE SET UP FOR RECEIPT, STORAGE AND MIXING

2. AREAS MUST BE ADEQUATE TO PRESERVE IDENTITY, PURITY, AND STABILITY

3. ORIGINAL STORAGE CONTAINERS FOR TEST CHEMICAL MUST BE MAINTAINED UNTIL THE FINAL REPORT IS ISSUED (NOT SO FOR ANALYTICAL STANDARDS)

4. RECEIPT AND DISTRIBUTION OF EACH BATCH ARE DOCUMENTED (INCLUDING DATE AND QUANTITY OF MATERIAL DISTRIBUTED OR RETURNED)

5. PROPER IDENTIFICATION IS MAINTAINED THROUGHOUT THE DISTRIBUTION PROCESS

6. DISTRIBUTION IS MADE TO PRECLUDE CONTAMINATION, DETERIORATION OR DAMAGE

7. IDENTITY:

   A. METHOD OF SYNTHESIS - DOCUMENTED BY SPONSOR TESTING FACILITY
   B. LOCATION OF THESE DATA SPECIFIED

8. DOCUMENT PURITY AND ANALYTICAL PROCEDURES USED

9. IMPURITIES - HOW IDENTIFIED

10. SOLUBILITY, WHEN RELEVANT TO STUDY CONDUCT

THESE LAST FOUR MUST BE DOCUMENTED BEFORE EXPERIMENTAL START DATE

11. STABILITY - PRIOR TO (OR CONCOMITANTLY WITH) USE IN A STUDY & ANALYTICAL PROCEDURES USED

STABILITY OF THE TEST CHEMICAL AND ANALYTICAL STANDARDS UNDER STORAGE CONDITIONS AT THE TEST SITE MUST BE KNOWN FOR ALL STUDIES

12. SOURCE AND LOT NUMBER

13. CORRESPONDENCE BETWEEN TEST CHEMICAL AND COMMERCIAL COUNTERPART

14. SOLUBILITY, WHEN RELEVANT TO CONDUCT OF STUDY

15. STORAGE CONTAINERS MUST BE LABELED WITH:

   A. NAME OR CODE NUMBER
   B. BATCH OR LOT NUMBER
   C. EXPIRATION DATE, IF ANY

D. STORAGE CONDITIONS, WHERE APPROPRIATE

FOR STUDIES OF MORE THAN FOUR WEEKS' EXPERIMENTAL DURATION, SAMPLES FROM EACH BATCH OF TEST CHEMICAL AND ANALYTICAL STANDARD MUST BE ARCHIVED AND RETAINED AS LONG AS THE QUALITY OF THE MATERIAL AFFORDS EVALUATION

16. MIXTURES OF SUBSTANCES WITH CARRIERS:

A. DETERMINE HOMOGENEITY, CONCENTRATION PERIODICALLY
B. DETERMINE STABILITY PRIOR TO OR CONCOMITANTLY WITH EXPERIMENTAL START DATE
C. DETERMINE SOLUBILITY - IF APPROPRIATE
D. DOCUMENT EXPIRATION DATE - IF ANY
E. VEHICLES USED TO FACILITATE MIXING CANNOT INTERFERE WITH THE INTEGRITY OF THE TEST

17. REAGENTS AND SOLUTIONS

ALL REAGENTS AND SOLUTIONS IN THE LABORATORY AREA MUST BE LABELED TO INDICATE:

A. IDENTITY
B. CONCENTRATION
C. EXPIRATION DATE
D. STORAGE REQUIREMENTS

RAW DATA COLLECTION

1. RECORD IN INK

2. SIGN AND DATE ON DAY OF ENTRY

3. CORRECT DATA PROPERLY WITH INITIALS, DATE, EXPLANATION

4. REFERENCE APPLICABLE SOPs

5. USE ERROR CODE SYSTEM

6. COMPUTER PRINTOUTS - ON-LINE, DIRECT ENTRY, DATA REDUCTION

7. STANDARD DATA FORM:

   ADVANTAGES:
   A. CONSISTENCY OF DATA RECORDING
   B. EASE OF DATA COMPILATION
   C. FACILITATES QA AUDITING

   DISADVANTAGES:
   A. NON-ROUTINE OBSERVATIONS MAY NOT BE RECORDED
   B. DATA SHEETS EASILY MISPLACED OR LOST
   C. DATA SHEETS EASILY TRANSCRIBED

8. BOUND NOTEBOOKS:

   ADVANTAGES:
   A. DATA NOT EASILY LOST
   B. TRANSCRIPTION NEARLY IMPOSSIBLE

   DISADVANTAGES:
   A. DATA RECORDING INCONSISTENT
   B. REPORT PREPARATION MORE DIFFICULT
   C. QA AUDITING MORE DIFFICULT

STUDY REPORTS

1. STUDY RESULTS SHOULD BE REPORTED CONSIDERING:

   - o PESTICIDE REGISTRATION NOTICE 86-5
   - o PESTICIDE ASSESSMENT GUIDELINES
   - o DATA REPORTING GUIDELINES
   - o STANDARD EVALUATION PROCEDURES
   - o GOOD LABORATORY PRACTICE STANDARDS
   - o REREGISTRATION PHASE 3 TECHNICAL GUIDANCE DOCUMENT

2. STUDY DIRECTOR AND SPONSOR COMPLIANCE STATEMENT:

   - o INACCURATE STATEMENTS WILL ELICIT PENALTIES

3. FREQUENTLY OVERLOOKED ITEMS:

   - o TEST SUBSTANCE AND ANALYTICAL REFERENCE STANDARDS CHARACTERIZATION AND STABILITY INFORMATION
   - o STORAGE LOCATION OF SAMPLES, RAW DATA, AND FINAL REPORT
   - o COPY OF FINAL REPORT MUST BE MAINTAINED BY SPONSOR AND TEST FACILITY
   - o STATISTICAL METHODS USED, SAMPLE CALCULATIONS

4. MUST INCLUDE ANY CHANGES MADE TO THE ORIGINAL PROTOCOL

5. TERMINATED OR DISCONTINUED STUDIES MUST HAVE A FINAL REPORT

   - o RAW DATA MUST BE MAINTAINED FOR TWO YEARS

6. AMENDED REPORT - COMPLETE REPORT MUST BE REISSUED WHICH CONTAINS:

   - o TITLE PAGE STATING "AMENDED FINAL REPORT"
   - o REVISED ADMINISTRATIVE STATEMENTS, INCLUDING DATED SIGNATURE OF STUDY DIRECTOR AND KEY STUDY PERSONNEL
   - o REVISED TABLE OF CONTENTS
   - o PAGE DEFINING PORTION OF ORIGINAL REPORT MODIFIED, CHANGES BEING MADE AND JUSTIFICATION FOR THOSE CHANGES
   - o AMENDED PAGES IDENTIFIED AS AMENDED

ARCHIVE REQUIREMENTS

- STORAGE CONDITIONS MUST MINIMIZE DETERIORATION
- DESIGNATED ARCHIVIST
- LIMITED ACCESS TO AUTHORIZED PERSONNEL
- MATERIAL INDEXED TO PERMIT EXPEDIENT RETRIEVAL
- DATA AND SPECIMEN SIGN OUT LOG
- RECORD RETENTION:

    PAPER, TISSUE BLOCKS AND SLIDES

        RETAIN AS LONG AS SPONSOR HOLDS REGISTRATION TO WHICH STUDY IS PERTINENT

    WET TISSUES AND ARCHIVED SAMPLES OF TEST SUBSTANCES AND ANALYTICAL REFERENCE STANDARDS

        RETAIN AS LONT AS THE QUALITY OF THE PREPARATION AFFORDS EVALUATION

    FRAGILE SAMPLES (SOIL, PLANTS, URINE, FECES, ETC.)

        RETAIN UNTIL QA VERIFICATION (UNTIL FINAL REPORT IS APPROVED)

MATERIALS MUST BE ARCHIVED PRIOR TO THE STUDY DIRECTOR SIGNING THE FINAL REPORT

GLPs CANNOT TURN BAD SCIENCE INTO GOOD SCIENCE

GLPs CAN MAKE GOOD SCIENCE EVEN BETTER

GOOD SCIENCE WITHOUT GLPs IS RISKY BUSINESS

4

Chapter
31

Good Laboratory Practice Standards Policies and Interpretations

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Numerous policy questions have been raised in regard to the Federal Insecticide, Fungicide, and Rodenticide Act Good Laboratory Practice (GLP) Standards, especially since the 1989 revisions added field tests, environmental effects, and environmental fate testing. How the Environmental Protection Agency (EPA) develops its policies, how major policy decisions have been made, how the EPA disseminates such information, and how to get policy questions answered are discussed, along with revisions being considered for GLP Standards violations.

THE U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA) promulgated its first Good Laboratory Practice (GLP) Standards regulations pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) in 1983 (*1*). These regulations were initiated as a result of problems found with data that had been submitted to the agency in support of registration of pesticides. The EPA amended these regulations in 1989 (*2*) to expand the GLP requirements to include field testing, environmental effects testing,

and environmental fate testing. Because of the broad nature of these regulations, numerous policy questions have been directed to the agency. The EPA has responded to many of these questions and continues to work on resolving a number of issues.

Managing the development of the revised FIFRA GLP Standards regulations to expand the coverage to the majority of studies submitted to the EPA under FIFRA and preparing responses to questions that have arisen have provided a unique challenge. Part of the challenge arose from the development of regulations for a diverse set of testing facilities, and the remaining challenge arose from setting consistent policy on how the EPA interprets and enforces the regulation. To understand how the EPA establishes policies, it is important to look at why GLP regulations were issued, what a policy does, how policy issues are identified, the process within the agency for developing a policy, the factors affecting policy decisions, and how the EPA makes its policies known. A separate but related issue is how the EPA responds to violations of the regulations.

Why GLP Regulations Were Necessary

The EPA relies largely on data submitted by registrants to make its regulatory decisions on pesticides. The importance of these studies to the EPA decision-making demands that all studies be conducted according to scientifically sound protocols with detailed attention to quality control. These studies must be performed as reported and the results must be correctly reported. Written with this goal in mind, the GLP Standards are general standards applicable to almost every type of study, and when correctly followed they ensure the integrity of data submitted.

To realize why GLP regulations are considered necessary, one must recognize that the impetus was the discovery of some extremely serious deficiencies in data that had been submitted to the Food and Drug Administration (FDA) and to the EPA. Prior to the mid-1970s, the EPA and the FDA generally accepted with little oversight the accuracy and validity of data submitted for regulatory decision making. However, in 1974 and 1975, problems surfaced in some laboratories generating data submitted to the FDA. As a result, the FDA initiated an inspection and audit program that provided for an in-depth examination of questionable studies. The FDA identified significant problems in the way some studies were being performed and reported to the administration.

The FDA findings caused the EPA concern over the validity of the data on which it was relying to make its decisions. Some data used by the EPA had originated from studies that were performed at the same labora-

tories where the FDA found problems. Moreover, the studies the EPA was relying on were similar to the studies for which the FDA had identified difficulties. Thus, the EPA began a laboratory data audit program similar to that of the FDA and closely coordinated with the FDA to determine if, indeed, data submitted to the EPA were also flawed. Although the EPA's experience indicates that most testing facilities were not involved in fraudulent submissions, one laboratory that had been responsible for fraudulent or misleading data submissions had supported studies for almost 600 chemicals. As a result of problems with this laboratory, the agency implemented a validation program to review approximately 1600 studies in which the laboratory had been involved. About 65% of those studies were deemed invalid. Thus, the impact of one laboratory with major problems was substantial, both in terms of the resources necessary to ensure that valid data supported registrations and in the public's confidence in the data and related regulatory decisions. Audits at other laboratories turned up a number of problems. One of the more common problems was a lack of supporting raw data that would allow the auditor or inspector to determine if the study had been performed as indicated.

To do a credible job of protecting the public and the environment, the EPA must be able to look at the supporting raw data and files and verify that studies were conducted as reported and that results are accurately reflected in the data that it uses to make its regulatory decisions. Thus, the agency felt it necessary to issue GLP regulations that specify certain minimal standards that make it possible for an inspector or auditor to go in during or after a study and know how that study was conducted with some certainty.

The initial FIFRA GLP Standards were proposed in 1980 (*3*), and final regulations became effective in May 1984, several years after the FDA promulgated GLP Standards under its statute (*4*). The 1984 regulations did not address all studies, although the EPA recognized the need to do this at some point. At the time the regulations were being prepared, the focus of the EPA's efforts was on health effects data because the FDA's investigative findings dealt solely with these data. The agency felt it needed more experience with some of the nonhealth effects studies in order to write GLP regulations applicable to them. The GLP regulations had a fairly narrow scope of types of studies, but the FIFRA § 8 recordkeeping regulations [40 *Code of Federal Regulations* (CFR) 169.2(k), which require that the data supporting all studies be kept for the life of the pesticide's registration, did not. Thus, whereas FIFRA GLP requirements initially applied to a limited range of studies, that is, health effects studies, the agency's data audit program encompassed all types of studies submitted to the EPA to support registrations.

In August 1989, the EPA published its final revised FIFRA GLP Standards rule, which expanded the coverage of the GLP Standards to

almost all studies submitted to the EPA under FIFRA. The revisions also made language changes to reflect changes that the FDA made to its GLP regulation in 1987 (*5*). The EPA's revisions thus ensure consistency between the two rules, as well as with the GLP rule issued by the EPA under the Toxic Substances Control Act (TSCA) (*6*). This revision was done to minimize the regulatory burden on laboratories that may conduct studies under all three statutes. The revised FIFRA GLP Standards rule became effective on October 16, 1989. The GLP Standards is a regulation, and its requirements are enforceable under FIFRA. The purpose of the GLP Standards as discussed in the preamble to the rules (*1–3*) is to ensure that studies are conducted as indicated with certain safeguards in place regarding the quality of the studies and that the required records and reports will allow reconstruction of the studies.

What a Policy Does

The GLP requirements are very general and apply to a wide array of studies. They address requirements regarding laboratory organization and personnel (e.g., requirements for a study director and quality assurance unit); requirements for the facility such as test, control, and reference substance handling and data storage; equipment requirements such as routine maintenance and calibration; facility operation requirements such as the need for standard operating procedures; requirements on test, control, and reference substances; protocol and conduct of study requirements; and record-keeping and reporting requirements. The GLP Standards provide flexibility to the laboratory by providing general requirements as opposed to the very detailed, specific requirements spelled out by the EPA.

Questions arise partly because of the general nature of the requirements and partly as a result of the uncertainty felt when requirements are implemented for the first time. Sometimes the question is a request for permission not to comply with the regulations. Policies issued by the agency or policy determinations made by the EPA such as those in response to letters do not change the regulation; they clarify what is intended and how the EPA reads the regulation. Answers to many questions that the regulated community has can be found by reading the preamble to the regulation because numerous questions were raised during the comment period after the rule was proposed. Some questions take a great deal of consideration to answer because all of the factors involved cannot be anticipated when a regulation is written. Although all issues may not have been specifically considered at the time the regulation was developed, a regulation cannot be changed by a policy; revisions to regulations require going through the full rule-making process, which can take

years. Therefore, the policy is based on what the regulation states, even if it is in general terms.

The agency may respond to violations with policies that in effect allow deviations from the regulations without those deviations being penalized. For example, on a case-by-case basis the agency may allow a laboratory to discard test substance containers prior to the end of the study if thousands of containers are involved, provided other measures are taken, as specified by the agency, that ensure that the intent of the GLPs are met. Written authorization from the Policy and Grants Division of the Office of Compliance Monitoring is necessary.

How Policy Questions Arise

Policy questions often arise from incoming correspondence from the regulated community. Responses to such correspondence may be a matter of a straightforward reading of the regulations, or they may involve a great deal of policy analysis. In correspondence in which the EPA has responded to a question on the regulations, the answer given may be applicable only to a specific set of circumstances and not necessarily to all situations, which may be similar but not identical in all aspects.

Policy issues are also raised during conferences, training sessions, and meetings with the regulated community; by inspectors; or by case development officers, at headquarters or in the regions alike.

The Process Within the Agency

Although official policy is issued by the Director of the Policy and Grants Division, Office of Compliance Monitoring, Office of Pesticides and Toxic Substances of the EPA, policy is not made by one or two people. It involves many individuals and several offices, depending on the complexity of the question. Many questions are variations of questions that have already been answered and may be handled easily by relying on previous answers. Other policy questions require in-depth analysis and coordination among the Office of Pesticide Programs, the Office of Compliance Monitoring, the Office of General Counsel, and the Office of Enforcement. In addition, the EPA often consults with the FDA to ensure consistent interpretations between its GLP regulations and the EPA's, both of which contain almost identical language on many requirements. Answers may involve scientific, technical, and legal decisions.

Factors Affecting Policy Decisions

Several key factors shape the answer to a policy question. First of all, FIFRA and the regulations promulgated pursuant to FIFRA must be considered as the governing factors. These regulations, including the GLP regulations, can only be changed by revising them and going through a formal comment and review period. In answering questions on the FIFRA GLP regulation, the EPA first looks at what the regulation states. The rule or the preamble to the rule may provide answers directly, and an in-depth analysis may not be necessary.

If someone suggests that a different interpretation is possible or asks for a different response from the agency's previous statements based on circumstances that were not fully anticipated at the time the regulations were written, EPA looks carefully at the purpose of the regulations to see if there is more than one way to satisfy reasonably the requirements in the context of the regulatory language. In addition, the EPA is very concerned about the need for consistency between how the EPA regulations, both FIFRA and TSCA GLP regulations, and the FDA GLP regulation are interpreted where the language is identical among the various regulations.

How EPA Disseminates Its Policy Determinations

Given the number of inspectors and other people involved within the EPA and the FDA in implementing the FIFRA GLP regulations, it is important that these people be aware of any policy statements or interpretations that the EPA makes for these regulations. One way of ensuring consistency is to direct all new policy questions to the Policy and Grants Division in the Office of Compliance Monitoring and to make sure that the EPA personnel involved in the GLP inspection and audit program receive information on new decisions. The EPA does this by sending copies to appropriate offices when correspondence is issued on GLPs, by making sure other divisions see such correspondence before it goes out and by running training sessions and conferences.

With regard to disseminating information to the regulated community, the EPA has used a number of mechanisms in the past and some that are being implemented now. The EPA has held a number of meetings with the regulated community to answer questions on the regulations; attended various seminars, symposia, and training sessions at the request of the regulated community; sponsored training sessions that were attended by representatives of the public and the regulated community; provided copies of responses to correspondence to the public and the

regulated community; and responded to incoming correspondence. Currently, the EPA is preparing a question-and-answer document specifically for the GLP regulations. This document will contain many of the questions to which the EPA has already responded, and new questions and answers will be added periodically until it represents a fairly complete set of FIFRA GLP policy issues to which the agency has responded. When this document is complete, the EPA plans to disseminate it to the professional organizations that have been involved in GLP issues and to the public.

The EPA is interested in how to make such information more readily available to the regulated community and continues to seek more effective ways of doing so. A better understanding of how the EPA views the regulations facilitates compliance.

Examples of Policy Issues

Archiving. The regulations require data to be archived during or at the close of the study. Some people have indicated that the complexity of studies performed at multiple locations causes delays in transferring material to be archived at the end of technical work. A grace period was suggested instead of requiring that all data be archived at the end of the study, that is, before or when the study director signs the final report.

The EPA reviewed the language in the rule, present EPA and FDA policy, and the technical aspects of studies newly subject to GLP Standards. The rule is clear in stating that data must be archived during or at the close of a study. Any change in this requirement would have to be made by amending the rule. Previous EPA and FDA policies are that the archiving must explicitly be completed before the study report is signed. Finally, there was not a difference in the technical needs of studies newly under GLP Standards that would suggest that they be treated differently than studies that the FDA monitors or the studies previously subject to the EPA GLPs. The benefit from archiving data at the end of the study is unchanged, and any practical difficulties arising from increased complexity of studies suggested that it would be, if anything, more beneficial to secure all raw data in archives before signing the final report.

Thus, on the basis of the most straightforward reading of the rule, the history of interpretation both at the EPA and at the FDA, and a practical evaluation of the GLP Standards in question, the EPA decided that this standard must be interpreted consistently for all studies, even in the case of more complex studies that are required to comply with GLP Standards because of the 1989 revisions.

In considering the concerns raised, the EPA examined the case of complex studies that occur at several locations and involve more than one discipline. It concluded that there is flexibility in the location of the archives of raw data and specimens. In 40 CFR 160.190(b), the GLP Standards state that retention of records at alternate locations is acceptable, provided that there is specific reference to those locations in the archives. Such off-location archives must still meet the full requirements of 40 CFR 160.190. Whether records are archived at a central location or at separate contractors' locations, the study director must ensure that all raw data and specimens have been archived before the study report is signed. In the case that the study director cannot ensure that records at a particular location are archived correctly, he or she should not sign a compliance statement that indicates that this standard has been met.

Quality Assurance Inspections. When the EPA amended the FIFRA GLP Standards, the EPA modified the requirement that each phase of each study be inspected to require simply that each study be inspected at adequate intervals. The wording that was used was adapted directly from the FDA's 1987 amendments. As stated, the wording is explicit in requiring that each study must be inspected at least once. Some people have suggested that this requirement is not consistent with the FDA's interpretation, which they state does not necessarily require each study to be inspected. The EPA reviewed this requirement and concluded that the wording explicitly required an inspection of each study.

Certain studies include work that is difficult to schedule according to a strict timetable because the work depends on conditions such as weather. The EPA was asked whether it would be acceptable to schedule quality assurance unit inspections of certain activities when there was no actual study in progress. These inspections were meant to help monitor that tasks were performed correctly without inspections being subject to last-minute rescheduling because of changes in weather.

The EPA reviewed the language of the rule to determine whether it was required that all inspections occur during study operations. The rule is in fact silent on this, which the EPA interprets as allowing flexibility. However, the requirement remains that each study be inspected at least once. Consequently, the EPA responded that it would be permissible for inspections of processes to be made when no actual work was in progress, although it would be necessary to demonstrate that the process subsequently used on a study was identical to the process that was inspected. Some part of the study must still be inspected when the study is in progress. This inspection could be arranged for a phase or location of the study that could be conveniently scheduled for inspection.

This interpretation was discussed with the FDA to ensure that it was not contrary to their policy regarding quality assurance inspections and was found to be acceptable.

Future Revisions to the Regulations

The current regulations are anticipated to remain in effect for some time. As concerns are raised, these concerns will be kept in mind if the agency initiates additional revisions.

Enforcement Policy

Violations of the GLP Standards may be discovered in a number of ways. Generally, the following represent the means by which most GLP violations are likely to be found: during laboratory inspections and data audits conducted by the EPA and the FDA; during the EPA's review of data submissions; through investigations of tips or complaints; or as a result of data called in. Under FIFRA (*7*), it is unlawful for any person

1. to knowingly falsify all or part of any application for registration, application for experimental use permit, . . . any records required to be maintained pursuant to the Act, any report filed under the Act, or any information marked as confidential and submitted to the Administrator under any provision of the Act [FIFRA Section 12(a)(2)(M)]
2. to falsify all or part of any information relating to the testing of any pesticide (or any ingredient, metabolite, or degradation product thereof), including the nature of any protocol, procedure, substance, organism, or equipment used, observation made, or conclusion or opinion formed, submitted to the Administrator, or that the person knows will be furnished to the Administrator or will become part of any records required to be maintained by the Act [FIFRA Section 12(a)(2)(Q)]
3. to submit to the Administrator data known to be false in support of a registration [FIFRA Section 12(a)(2)(R)]

FIFRA provides the authority to issue notices of warning for minor violations and to assess administrative civil penalties of up to $5000 per violation. Any person who knowingly violates FIFRA may also incur criminal penalties of up to $50,000 or 1 year imprisonment. The level of response, and the appropriate penalty within that level, is determined by the nature and severity of the violation. The violator's size of business and ability to pay must be considered when administrative civil penalties are issued. Falsification of submissions or records may be the basis for a criminal referral under the U.S. Code of Violations (18 U.S.C. 1001). Actions may be taken against the registrant, the laboratory, or individuals for falsifying the certification statements, records, or reports. Generally, the EPA will examine the specific case to determine who is most appropriately subject to an enforcement action.

In addition to the direct penalties provided under FIFRA, failure to submit a true and correct compliance statement may be used as the basis for rejection of studies. Where a study is not conducted in accordance with GLP Standards, the EPA may refuse to consider the data as meeting requirements. Submission of a false statement of compliance may also be the basis for the cancellation or suspension of a registration, modification of the research or marketing permit, or denial of an application for such a permit.

In its July 2, 1990, FIFRA Enforcement Response Policy (ERP) (*8*), the EPA presented its policy regarding penalty determinations for FIFRA violations. Copies of the FIFRA ERP may be obtained by writing FIFRA ERP, Pesticide Enforcement Policy Branch, Office of Compliance Monitoring (EN–342), The Environmental Protection Agency, 401 M Street S.W., Washington, DC 20460.

The ERP includes tables that list the gravity levels for each violation of FIFRA and matrices for determining appropriate penalty amounts based on the gravity level, size of business, history of noncompliance, culpability of the violator, and harm to human health or the environment. The ERP applies to any violations of FIFRA, including those concerning the GLP regulations. Specific FIFRA charges given in the ERP are in reference to § 12(a)(2)(M), for knowing falsification of reports submitted to the EPA; § 12(a)(2)(Q), for falsifying information related to testing; and § 12(a)(2)(R), for submission of data known to be false.

The July 2, 1990, FIFRA ERP addresses GLP violations in the following manner: A high-level GLP violation has a maximum civil penalty of $5000 per violation; a middle-level GLP violation has a maximum civil penalty of $4000 per violation; and a low-level GLP violation has a maximum civil penalty of $3000 per violation. On September 30, 1991, the EPA issued a GLP ERP supplement (*9*) to the July 2, 1990 FIFRA ERP that defines which violations of the GLPs constitute high-, middle-, or low-level violations.

The supplement describes in greater detail the appropriate enforcement response for specific GLP violations. (See Appendix C of this book for the text of the EPA's penalty policy.) For drafting the supplement, the EPA reviewed specific GLP Standards for relative gravity associated with the violation.

Conclusion

The EPA relies on FIFRA and the regulations promulgated pursuant to this statute to determine responses to policy questions. At the same time, it strives to allow flexibility under those requirements consistent with maintaining the goals of the GLP Standards. In responding to policy questions, the agency examines the concerns raised and tries to apply the law in a reasonable and fair manner. The efforts by the regulated community to identify issues and to obtain resolution as soon as possible are much appreciated.

The EPA is prepared to apply enforcement remedies to violators. An active compliance and enforcement program is important to prevent credibility problems for those in the regulated community who comply as well as for the EPA. However, the EPA prefers to work with the regulated community to obtain compliance up front instead of relying solely on enforcement actions. The agency recognizes that ensuring the validity and integrity of data developed and submitted is a goal shared by the regulated community and the federal government. Opportunities to further this goal through meetings, correspondence, and other outreach efforts are welcomed.

References

1. "Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Good Laboratory Practice Standards; Final Rule"; *Federal Register* 48:53964 (November 29, 1983).

2. "Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Good Laboratory Practice Standards; Final Rule"; *Federal Register* 54:34052 (August 17, 1989).

3. "Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA

Good Laboratory Practice Standards; Proposed Rule", *Federal Register* 45:26373 (April 18, 1980).

4. "Nonclinical Laboratory Studies: Good Laboratory Practice Standards: Final Rule", *Federal Register* 43:59986 (December 22, 1978).
5. "Good Laboratory Practice Standards: Final Rule", *Federal Register* 52:33768 (September 4, 1987).
6. "Toxic Substances Control Act (TSCA) Good Laboratory Practice Standards; Final Rule", *Federal Register* 54:34034 (August 17, 1989).
7. "Federal Statute: Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)", Title 7 U.S. Code 136 et seq., as revised October 1988.
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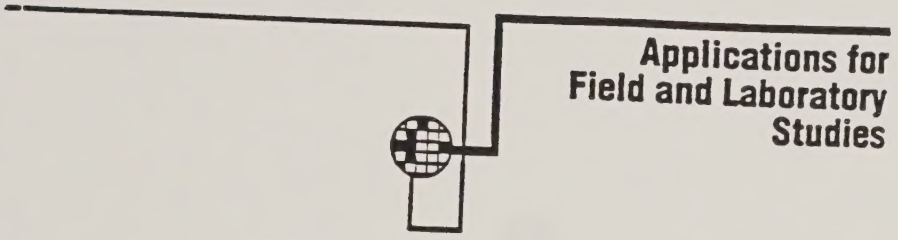
RECEIVED for review September 17, 1990. ACCEPTED revised manuscript August 17, 1991.

Good Laboratory Practice

Standards



Applications for Field and Laboratory Studies

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ACS Professional Reference Book

American Chemical Society, Washington, DC 1992